EPA Region 5 Records Ctr.
200883

ATTACHMENT 32

Declaration for the Record of Decision
Acme Solvent Reclaiming, Inc.
Winnebago County, Illinois
December 6, 1990

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Acme Solvent Reclaiming, Inc.
Winnebago County, Illinois

STATEMENT OF BASIS AND PURPOSE

This decision document represents the selected remedial action for the Acme Solvent Reclaiming, Inc. site in Winnebago County, Illinois. This action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, with the National Oil and Hazardous Substances Contingency Plan (NCP). This decision is based on the Administrative Record for this site.

The State of Illinois is expected to concur with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This remedy is the second of three potential operable units at the site. The first operable unit ROD called for excavation and incineration of soil, sludge, and other waste materials buried at the site. Instead, approximately 90 percent of these materials were excavated and disposed of in a hazardous waste landfill without the consent of USEPA or IEPA and approximately 10 percent remains on-site. Home carbon treatment units were provided to residents affected by site contamination, and additional studies were performed at the site under that ROD.

This second operable unit remedial action provides for treatment of the principal threats posed by contaminants in waste areas, soils, bedrock, and groundwater. Remaining risks at the site are reduced by engineering controls. A potential third operable unit will address an area of groundwater contamination between this and another Superfund site when additional studies have been completed to determine the source of this contamination.

The major components of the selected remedy include:

- Excavation of soils and sludges in two waste areas and treatment by low-temperature thermal stripping.

- Further treatment of residuals, if necessary, by solidification and on-site or off-site disposal.

- Incineration of the liquids and sludges in two tanks remaining on the site and disposal of the tanks.

- Provision of a permanent alternate water supply to residents with contaminated wells.

- Extraction and treatment of VOC-contaminated groundwater and discharge to surface water.

- Treatment of remaining VOC-contaminated soils and, if possible, bedrock by soil/bedrock vapor extraction.

- Consolidation of soils with remaining SVOC, PCB, and lead contamination and covering these soils and areas where residuals are landfilled on-site with a RCRA Subtitle C compliant cap.

- Long term groundwater monitoring.

- Fencing the site and providing, to the extent possible, deed and access restrictions and deed notices or advisories for residences with contaminated groundwater.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies which employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted at least every five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

12/31/90
Date

Valdas V. Adamkus
FOR Regional Administrator
Region V

RECORD OF DECISION SUMMARY
ACME SOLVENT RECLAIMING, INC.

I. SITE LOCATION AND DESCRIPTION

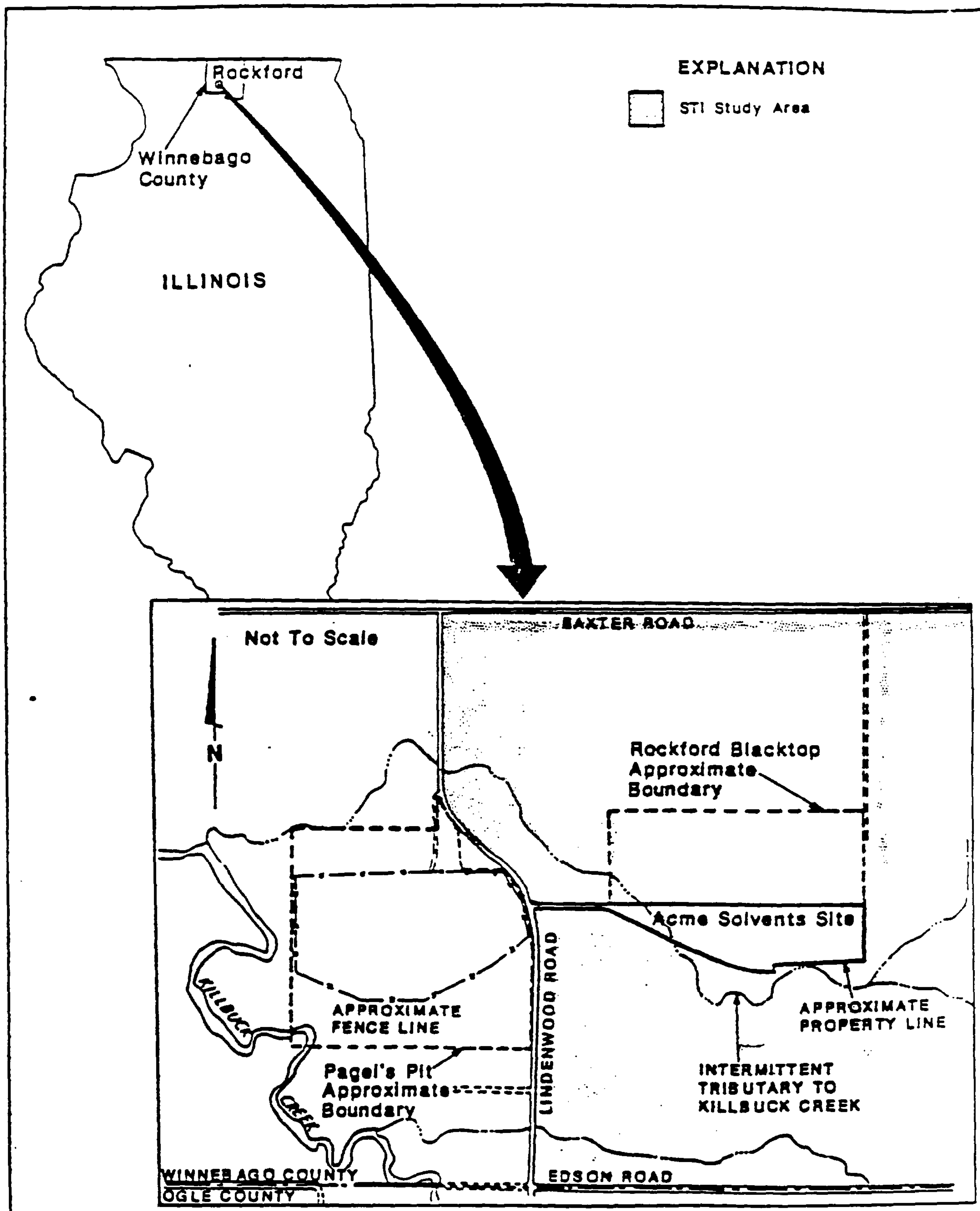
The Acme Solvent Reclaiming, Inc. site is located at 8400 Lindenwood Road, approximately five miles south of Rockford, Winnebago County, in northern Illinois (see Fig. 1). The site consists of approximately 20 acres of rolling uplands in a predominantly rural area. The only features on the site are a soil mound remaining from a previous removal operation, two 8,000 gallon tanks containing liquids and sludges, and a fenced decontamination area built during the site investigation.

Land around the site is used for agriculture, quarrying, and low-density, single family residences. The site is bounded by an active quarry to the north and farmland to the south and east. Immediately to the west is another Superfund site, Pagel's Pit Landfill (also known as Winnebago Reclamation Landfill). An ongoing remedial investigation/feasibility study (RI/FS) at Pagel's Pit is expected to be completed in 1991.

Approximately 400 people live within two miles of the site. The closest downgradient residences to the site are approximately 14 homes on Lindenwood and Edson Roads, with the nearest residence approximately one quarter mile from waste disposal areas. All residences in the area use private wells for their water supply.

An intermittent stream runs across and to the south of the site. The stream is a tributary to Killbuck Creek, which drains to the Kishwaukee River, then the Rock River. With the exception of the Rock River, surface waters downstream of the site are not used for public water supply. There are no floodplains, wetlands, critical habitats, or endangered species on or near the site.

The site is underlain by a thin layer of unconsolidated deposits. The unconsolidated deposits overlie the dolomites of the Platteville and Galena Groups. These dolomites, and the saturated unconsolidated deposits, comprise the Galena-Platteville aquifer. The Galena-Platteville aquifer has been classified as a Class II aquifer under United States Environmental Protection Agency's (USEPA's) Groundwater Protection Strategy and is extensively pumped by residential-supply wells in northern Illinois. The Galena and Platteville dolomites are underlain by the dolomitic shales and sandstones of the Glenwood Formation, a semi-confining unit which separates the overlying Galena-Platteville aquifer and the underlying St. Peter Sandstone aquifer. The St. Peter Sandstone aquifer is also a Class II aquifer and is extensively pumped for domestic, industrial, and municipal water-supply in northern Illinois.



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Site Location Map

Acme Solvents Reclaiming, Inc., Site
Winnebago County, Illinois

FIGURE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AT Jr.	17683,010.10		11/86		

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1960 to 1973, the Acme Solvents site served as a disposal site for paints, oils, and still bottoms from the Acme Solvent Reclaiming, Inc. solvent reclamation plant in Rockford, Illinois. Wastes were dumped into depressions created from previous quarrying operations or by scraping overburden from the near surface bedrock to form berms. Empty drums were also stored at the site.

In September 1972, the Illinois Pollution Control Board (IPCB) ordered the operator to remove all drums and wastes from the site and to backfill the lagoons after the removal. Followup inspections subsequent to this Order revealed that the wastes and crushed drums were being left on site and covered with soil.

Releases from the facility were first documented in 1981 when downgradient residents complained of poor smelling drinking water from private wells. Sampling and analysis of well water showed chlorinated organic compounds at concentrations exceeding the USEPA's Health Advisories for drinking water. The Illinois Environmental Protection Agency (IEPA) recommended that these wells not be used, and in 1981 the owner of Pagel's Pit Landfill agreed to voluntarily supply affected residents with bottled water.

The Acme Solvents site was proposed to the National Priorities List (NPL) in 1982 and was included on the final NPL in September 1983. IEPA completed an RI/FS in 1984, and on September 27, 1985, USEPA signed a Record of Decision (ROD) to excavate an estimated 26,000 cubic yards (cy) of contaminated soils and sludges and treat them by on-site incineration. The ROD also called for provision of home carbon treatment units (HCTUs) to residents affected by site contamination and for further study of the groundwater and bedrock.

USEPA attempted to negotiate an agreement to implement the ROD with approximately 65 Potentially Responsible Parties, (PRPs), including the site owner/operators and several generators. USEPA and the PRPs were not able to reach an agreement. Instead, a consortium of 23 PRPs chose to disregard USEPA's ROD and to excavate and transport sludges and soils to permitted hazardous waste landfills. This action resulted in the inclusion of a new provision in the Superfund Amendments and Reauthorization Act of 1986, prohibiting unauthorized remedial actions by PRPs.

The PRP action was terminated in November 1986 when USEPA's Land Disposal Restrictions (LDRs), which prohibited land disposal of solvent- and dioxin-contaminated waste without treatment, went into effect. The PRP action removed approximately 40,000 tons of soil and sludge from the site, or an estimated 90 percent of the total. After completion of the action, an approximately 4,000-

ton waste pile and two tanks containing contaminated liquids and sludges remained at the site. Since then, an additional waste area containing approximately 2,000 tons of soils and sludges has been discovered.

In December 1986, 23 PRPs entered into a Consent Order with USEPA and IEPA to further study the remaining soil, bedrock, and groundwater contamination and to provide HCTUs and monitoring to affected residents.

Under this Consent Order, Harding Lawson Associates (HLA), a consultant for the PRPs, completed a Supplemental Technical Investigation (STI) in May 1990, an Endangerment Assessment (EA) in June 1990, and a Remedial Action Alternatives Evaluation (RAAE) in September 1990. HLA also completed an Engineering Evaluation/Cost Analysis (EE/CA) in August 1990 to evaluate alternatives to address the remaining waste areas and the two tanks (see Fig. 2).

USEPA issued general notice letters on June 9, 1990, informing PRPs of USEPA's intent to negotiate a remedial action for this site. Special notice letters will be issued and negotiations will begin after completion of this Record of Decision.

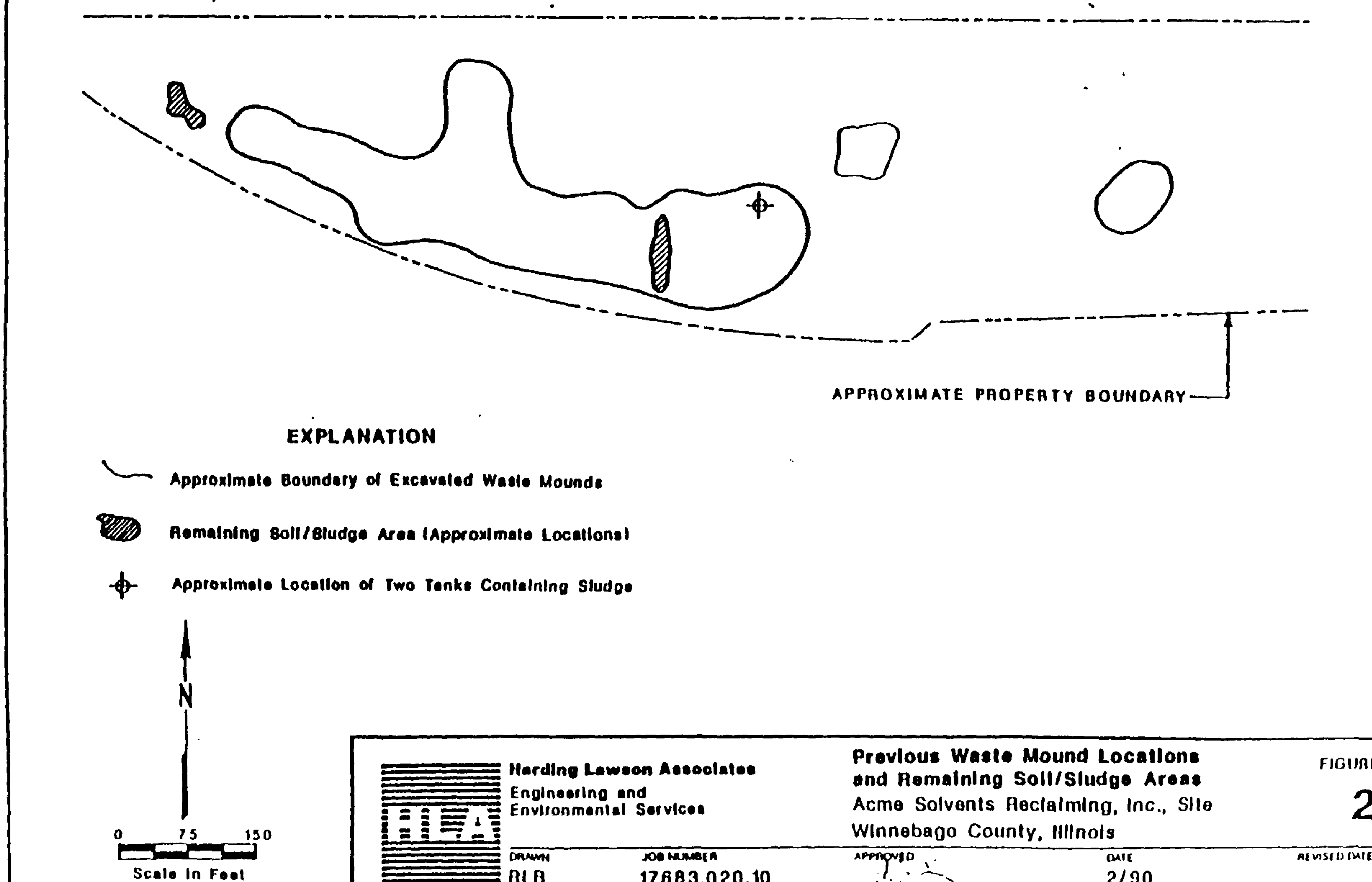
III. COMMUNITY RELATIONS ACTIVITIES

USEPA and IEPA have been conducting community relations activities at the site since early 1983. During the original RI/FS, IEPA developed a community relations plan, and in accordance with that plan, IEPA conducted small group meetings, public meetings, and issued fact sheets and letters to residents. USEPA has conducted community relations activities since the start of the STI in 1986.

A proposed plan was released to the public on October 5, 1990, informing residents that the STI report, EE/CA, and RAAE, along with other documents comprising the Administrative Record for the site, were available at the public information repository at the Rockford Public Library. The Administrative Record index is included as Appendix A. A public comment period was held from October 5, 1990, to November 5, 1990, and a public meeting was held on October 18, 1990, to discuss the proposed remedial action with residents. Public comments and USEPA responses are included as Appendix B.

IV. SCOPE AND ROLE OF RESPONSE ACTION

This response action is the second of three potential operable units. The first operable unit, set forth in the September 1985 ROD, called for provision of an interim alternate water supply (HCTUs) to downgradient affected residents, and treatment of the sludge disposal areas on-site. The HCTU portion of the remedial



Harding Lawson Associates
Engineering and
Environmental Services

Previous Waste Mound Locations and Remaining Soil/Sludge Areas
Acme Solvents Reclaiming, Inc., Site
Winnebago County, Illinois

FIGURE
2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
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action has been completed. The waste disposal areas, however, were not remediated in a manner consistent with USEPA's ROD, and approximately 6,000 tons of soil/sludge were not addressed during the PRP cleanup.

This operable unit will address the remaining waste disposal areas as well as all remaining soil and bedrock contamination on-site. Contaminated groundwater will also be addressed except as discussed below.

The third and final operable unit will address an area of groundwater contamination at the southeast corner of Pagel's Pit Landfill if it is determined that Acme Solvents is wholly or partially responsible for this contamination. Further studies are needed to determine the source of this contamination, and a ROD will address this area as soon as USEPA has determined the source of this contamination.

V. SITE CHARACTERIZATION

Results of the STI have shown that groundwater, soil, and subsurface bedrock on and around the Acme Solvent site have been contaminated. Volatile organic compounds (VOCs) are the principal contaminants found in all affected media. Semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganic contaminants have also been detected in soils and waste areas.

Waste Areas

The STI identified two remaining waste disposal areas on-site (see Fig. 2). The first waste area consists of approximately 4,000 tons of soil and sludges and is located in approximately the center of the site. Two 8000-gallon storage tanks containing liquids and sludges are also present near this area. Sampling in this area was performed during the PRP removal action in 1986 without USEPA supervision. Waste area samples showed total VOCs as high as 14,700 mg/kg and total PCBs as high as 52 mg/kg. Sampling of tank contents showed PCBs as high as 138 mg/kg and lead as high as 2,800 mg/kg. EP Toxicity testing of tank contents showed levels below regulatory standards. These data are not included in the data summary tables because USEPA has no information about its quality.

During the course of the STI, a second approximately 200 by 40-foot waste area was discovered in the northwest corner of the Acme site. Fifty-six samples were collected from 29 test pits and approximately 100 rusted one-gallon pails were removed in 1990. VOCs, SVOCs, and PCBs were detected in test pit samples. Metals were detected above background levels in all samples (see Table 1).

TABLE 1

CONTAMINANTS DETECTED IN SOIL

NORTHWEST AREA

Contaminants Detected	Maximum Concentration[1]	Frequency of Detection[2]	Background Value[3]
VOCs (ug/kg)			
1,1,1-Trichloroethane	10	1/56	NA
1,2-Dichloroethene	44,000	6/56	NA
Carbon Disulfide	0.5	6/56	NA
Chloroform	3	1/56	NA
Chloromethane	2	1/56	NA
Ethylbenzene	290,000	7/56	NA
Tetrachloroethene	31,000	33/56	NA
Total Xylenes	1,500,000	9/56	NA
Trichloroethene	4,500	11/56	NA
SVOCs (ug/kg)			
2-Methylnaphthalene	8,600	3/7	NA
Bis(2-ethylhexyl)phthalate	1,300,000	7/7	NA
Butylbenzyl phthalate	190,000	4/7	NA
Di-n-butyl phthalate	480,000	4/7	NA
Isophorone	14,000	1/7	NA
Naphthalene	320,000	4/7	NA
Phenol	180	1/7	NA
PCBs (ug/kg)			
Total PCBs	290,000	6/7	NA
Inorganics (mg/kg)			
Aluminum	17,900	6/7	2,500
Arsenic	20.9	6/7	3.5
Barium	1,190	6/7	22
Chromium	14,500	7/7	5.9
Iron	54,900	NA[4]	NA
Lead	52,500	7/7	9.1
Zinc	4,440	7/7	8.5

TABLE 1 (Con't)

ALL OTHER SOILS

Contaminants Detected	Maximum Concentration	Frequency of Detection	Background Value
VOCs (ug/kg)			
1,2-Dichloroethene (cis and trans)	6,000	2/21	NA
1,1,1-Trichloroethane	5.50	1/21	NA
Trichloroethene	3,100	1/21	NA
4-Methyl-2-pentanone	7,400	2/21	NA
Tetrachloroethene	3,400	5/21	NA
Ethylbenzene	29,000	2/21	NA
Total Xylenes	210,000	4/21	NA
SVOCs (ug/kg)			
Isophorone	1,035	2/21	NA
Naphthalene	170	1/21	NA
Phenanthrene	180	2/21	NA
2-Methylnaphthalene	130	3/21	NA
Fluoranthene	7	1/21	NA
Pyrene	62	4/21	NA
Benzo(b)fluoranthene	8	1/21	NA
Di-n-butylphthalate	13,000	1/21	NA
Bis(2-ethylhexyl)phthalate	59,000	7/21	NA
PCBs (ug/kg)			
Aroclor-1254	4,000	4/21	NA
Inorganics (mg/kg)			
Aluminum	6,700	21/21	2,500
Arsenic	8.8	21/21	3.5
Barium	230	21/21	22
Chromium	260	21/21	5.9
Lead	2,800	21/21	9.1
Zinc	220	21/21	8.5

[1]Data qualifiers not included
[2]For inorganics, indicates detection above established background
[3]Background established from one soil sample taken from the eastern portion of the site, in an area unaffected by disposal operations
[4]Background value for iron not established

NA = not available

An estimated 2,000 tons of soils and sludges is present in the northwest area. A total of approximately 6,000 tons of soil/ sludge material remains on-site in the two waste areas. Most contaminant concentrations were one to two orders of magnitude higher in the waste areas than in other site soils.

Soil Investigation

Immediately after the 1986 removal, soil samples were collected (without USEPA or IEPA supervision) from sidewalls, stockpiled soils, backfilled soils, and exposed bedrock. Analytical results of soil samples indicated total VOC concentrations from 0.6 - 275 mg/kg; and total SVOC concentrations from 0.1 - 330 mg/kg. Results of bedrock samples for total VOCs ranged from 0.6 - 1600 mg/kg and for total SVOCs from 180 - 5320 mg/kg. The primary VOCs identified in these soil and bedrock samples were tetrachloroethene (PCE), 1,1,1 trichloroethane (111-TCA), trichloroethene (TCE), total xylenes, toluene, and ethylbenzene. The primary SVOCs identified were isophorone, naphthalene, and phenol. These data were not included in Table 1 because USEPA has no information about its quality.

In 1988, 21 composite and discrete soil samples were collected within and adjacent to the waste areas excavated in 1986. Results are summarized in Table 1. Nine VOCs, seven SVOCs, and PCBs were detected. Six metals exceeded background concentrations.

Bedrock Gas

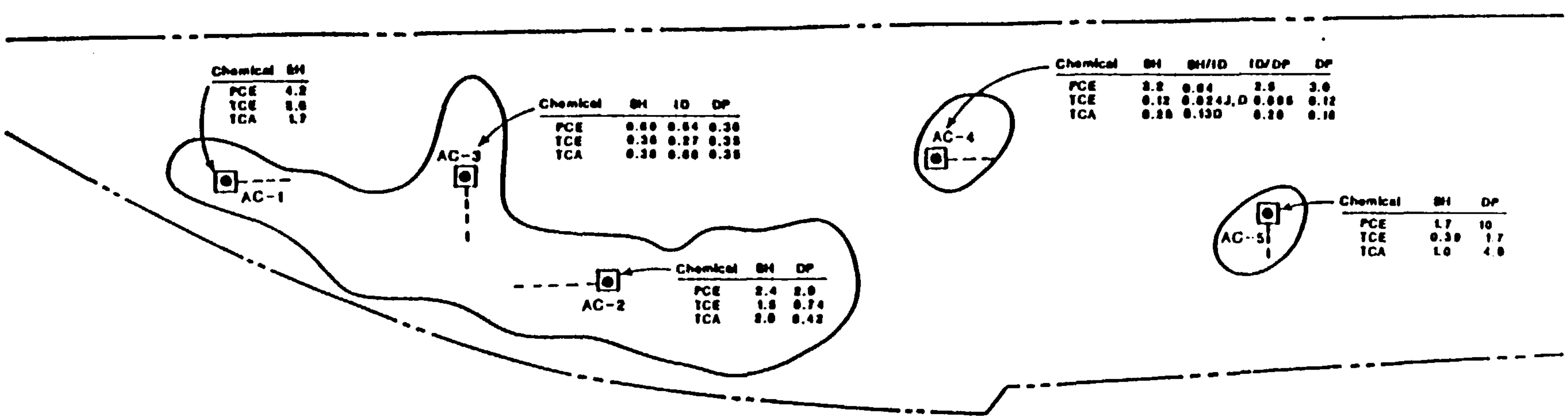
Twelve bedrock gas probes were installed in five angled coreholes beneath previously excavated waste areas. Probes were sampled quarterly for one year to determine VOC concentrations in the bedrock gas. Nine VOCs were detected. PCE, TCE, and TCA were detected in the highest concentrations and greatest frequency in all 12 bedrock gas probes (see Fig. 3).

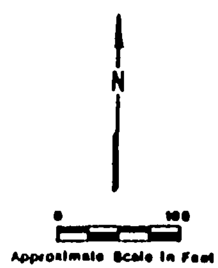
Hydrogeology

The following geologic units exist below the Acme Solvents Site and surrounding area:

- Unconsolidated deposits
- Galena-Platteville Dolomite
- Glenwood Formation
- St. Peter Sandstone Formation

Unconsolidated deposits range from 0 to 6 feet in thickness under the Site, increasing to about 85 feet south of the Acme Site, and are unsaturated under the site. The Galena-Platteville aquifer, which is approximately 220 feet thick, and the St. Peter Sandstone aquifer, which has an average thickness of 320 feet,





EXPLANATION

PCE Tetrachloroethane

TCE Trichloroethane

TCA 1,1,1-Trichloroethane

Bedrock Core Hole Location Showing Direction of Drilling

Approximate Potentially Affected Area Boundaries

BH Shallow Depth Interval

ID Intermediate Depth Interval

DP Deep Depth Interval

D Compound Detected

All Vapor Phase Concentrations in ppm(v/v)

J Estimated Concentration at or below the CRQL

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Bedrock Core Hole Locations with Vapor Concentrations of VOCs

Acme Solvents Reclaiming Inc., Site
Winnebago County, Illinois

FIGURE 3

DRAWN | JOB NUMBER | APPROVED | DATE | REVISED DATE are considered the two major hydrostratigraphic units (HSU) beneath the site. The Galena-Platteville HSU and St. Peter Sandstone HSU are separated by the Glenwood Formation. The Glenwood Formation is comprised of interbedded dolomitic shale and quartz sandstone. It has an average thickness of 40 feet and is moderately to little fractured, with the exception of the basal beds, which are highly fractured. The Glenwood Formation partially restricts flow between the two HSUs. Unconfined flow within the Galena-Platteville aquifer is generally to the west and south through fractures and solution features. Such flow can be difficult to characterize and is generally complex. Confined flow in the St. Peter Sandstone aquifer is intergranular. A typical water table map for the Galena-Platteville aquifer is shown in Fig. 4.

Beginning in 1988, groundwater samples were collected from new and previously installed monitoring wells. These included 28 wells completed in the Galena-Platteville aquifer, and four wells completed in the St. Peter Sandstone aquifer. Additionally, beginning in 1987, groundwater samples were taken from private water supply wells at 16 residences, including the five residences where HCTUs were installed.

Twelve VOCs, seven SVOCs, and three metals (above background) were detected in the Galena-Platteville monitoring wells (see Table 2). Figure 5 shows the distribution of 1,2-dichloroethene, the contaminant found most extensively in the Galena-Platteville aquifer. Ten VOCs were detected in the residential water supply wells (see Table 2). Of the four wells completed in the St. Peter Sandstone aquifer, only MW201A showed VOC contamination. This well is screened mostly through the Glenwood Formation; the screen extends only a few feet into the St. Peter aquifer. Only low levels of VOCs were found in MW210A, and no VOC contamination was found in any of the other St. Peter wells (see Table 2).

Contaminant Migration

Sampling data verified that sludge material in waste areas has contaminated near-surface soils. Additionally, the bedrock gas sampling program conducted in Galena-Platteville subsurface fractures has documented bedrock gas contamination from either the leaching of contaminants through soils into fractures or diffusion and volatilization of contaminated groundwater into fractures, or both. Bedrock gas VOC concentrations were somewhat higher than would be predicted by volatilization of VOCs from groundwater, indicating that VOCs in bedrock gas may contribute to groundwater contamination.

Subsequent leaching of VOCs has affected groundwater in the Galena-Platteville aquifer and produced contaminant plumes which are migrating off-site. Elevated levels of SVOCs and metals were also detected in the aquifer, however, PCBs do not appear to have

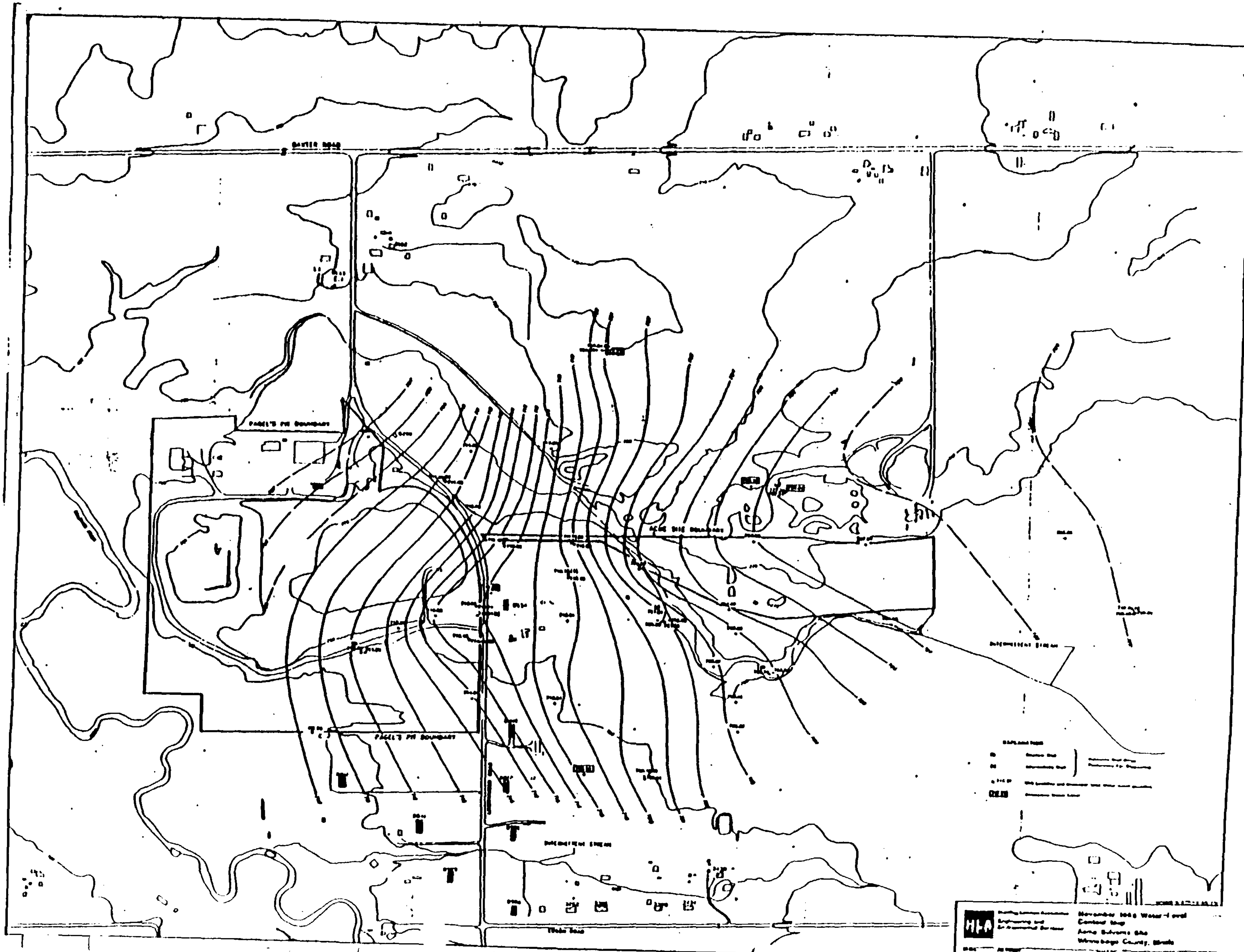

PAGEL'S PIT BOUNDARY
ACME SITE BOUNDARY
INTERMITTENT STREAM
HLA
Contour Map
Acme Solvents Site

TABLE 2

CONTAMINANTS DETECTED IN GROUNDWATER

GALENA-PLATTEVILLE

Contaminants Detected	Maximum Concentration[1]	Frequency of Detection	Background Range[2]
VOCs (ug/l)			
Vinyl Chloride	1000	13/118	NA
1,2-Dichloroethene	2400	40/118	NA
1,1-Dichloroethene	28	18/118	NA
1,1-Dichloroethane	405	23/118	NA
1,2-Dichloroethane	42	5/118	NA
1,1,1-Trichloroethane	265	32/118	NA
1,2-Dichloropropane	29	14/118	NA
Trichloroethene	260	31/118	NA
Benzene	39	12/118	NA
Tetrachloroethene	480	39/118	NA
Ethylbenzene	170	9/118	NA
Total Xylenes	1100	1/118	NA
SVOCs (ug/l)			
Phenol	35	1/118	NA
1,4-Dichlorobenzene	15	8/118	NA
1,2-Dichlorobenzene	1	2/118	NA
Isophorene	4	3/118	NA
Benzoic Acid	2	1/118	NA
Naphthalene	13	8/118	NA
N-Nitrosodiphenylamine	1	1/118	NA
Inorganics (mg/l)			
Arsenic	0.038	55/118	<0.001 - 0.008
Barium	0.396	40/118	<0.05 - 0.13
Chromium	0.032	1/118	<0.01 - 0.032
Iron	11.0	23/118	<0.10 - 0.26
Lead	0.015	10/118	<0.005 - 0.005
Zinc	7.73	102/118	0.070 - 4.3

TABLE 2 (Con't)

RESIDENTIAL (UNTREATED)

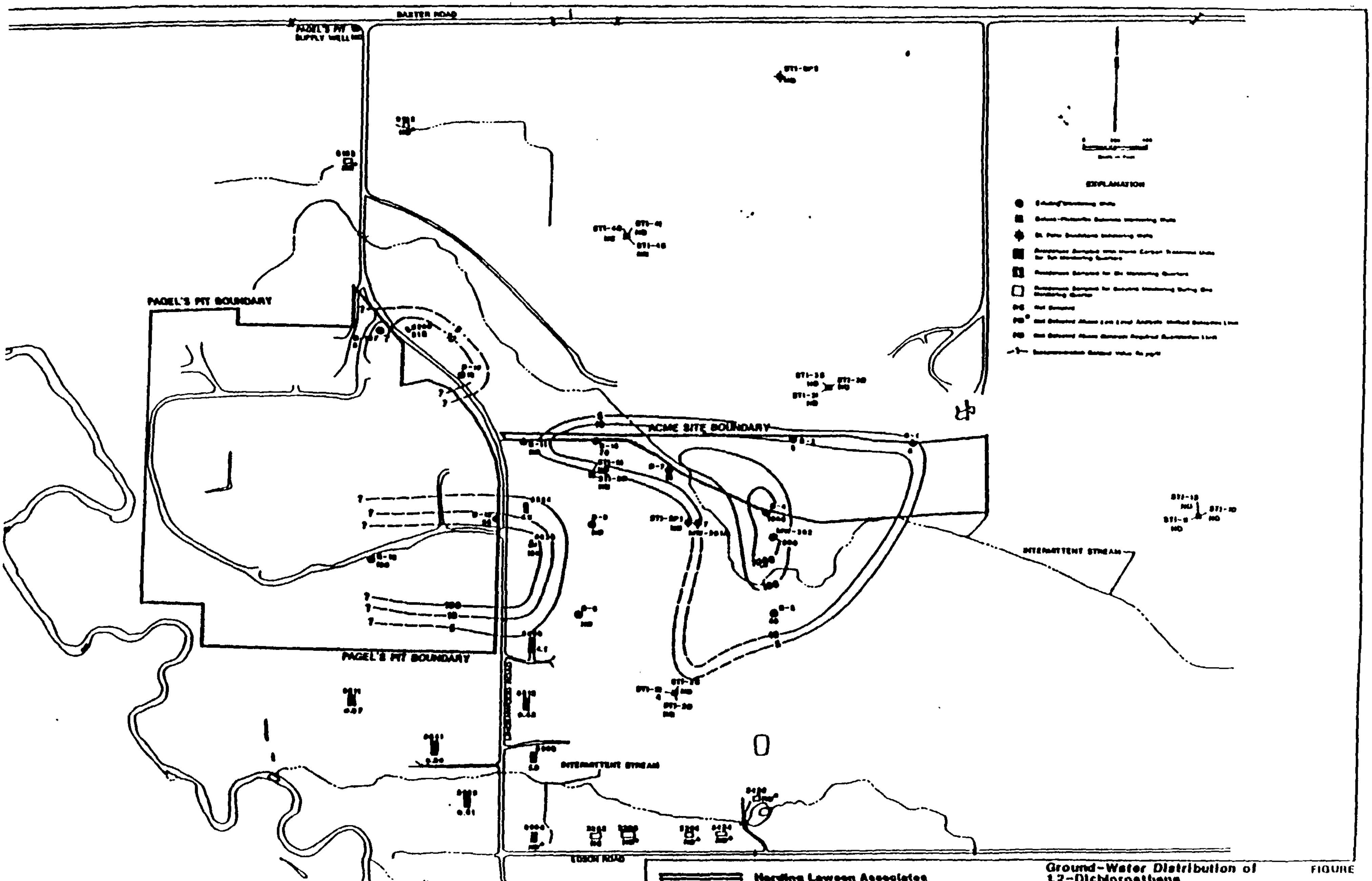
Contaminants Detected	Maximum Concentration	Frequency of Detection
VOCs (ug/l)		
Vinyl Chloride	8	14/75
1,1-Dichloroethene	2.5	4/75
1,1-Dichloroethane	14	28/75
1,2-Dichloroethene	170	58/75
1,1,1-Trichloroethane	12	42/75
1,2-Dichloropropane	2	15/75
Trichloroethene	13	42/75
Benzene	2	6/75
Tetrachloroethene	10	58/75
Chlorobenzene	1	4/75
Inorganics (mg/l)		
Arsenic	0.002	1/46
Barium	0.198	30/46
Chromium	0.010	1/46
Iron	0.921	13/46
Lead	0.033	5/46
Zinc	0.593	22/46

ST. PETER

Contaminants Detected	Maximum Concentration	Frequency of Detection
VOCs (ug/l)		
1,2-Dichloroethene	8	4/22
Trichloroethene	6	4/22
Inorganics (mg/l)		
Arsenic	0.003	2/22
Barium	0.104	6/22
Zinc	1.69	17/22

[1]Data qualifiers not included
[2]The background range for the Galena-Platteville aquifer was established from samples taken from the STI-1, STI-3, and STI-4 well clusters (see Fig. 5)

NA = not available



Harding Lawson Associates Engineering and Environmental Services	Ground-Water Distribution of 1,2-Dichloroethene Galena-Platteville Dolomite Acme STI Winnebago County, Illinois		FIGURE 5
DRAWN AT Jr.	JOB NUMBER 17683,012.10	APPROVED	DATE 10/89

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migrated to groundwater. Sampling has indicated that the St. Peter Sandstone aquifer has not been adversely affected.

Based on the specific physical characteristics of the site and the known contaminant distribution, groundwater flow is considered the primary migration pathway.

Surface water samples were not collected because the intermittent stream that crosses the site was dry during the STI. It is believed that any past and future flow in the nearby stream channel would recharge the groundwater system rather than provide a conduit for groundwater discharge. Therefore, contaminated groundwater is not believed to have migrated off-site through this intermittent stream channel.

VI. SUMMARY OF SITE RISKS

An endangerment assessment (EA) was developed for the Acme Solvents site in accordance with USEPA's 1989 Risk Assessment Guidance for Superfund (RAGS). The purpose of an EA is to analyze the potential adverse health effects, both current and future, posed by hazardous substance releases from a site if no action were taken to mitigate such a release. The EA consists of data evaluation and selection of contaminants of concern, toxicity assessment, exposure assessment, and risk characterization.

Selection of Contaminants of Concern

Groundwater and soil data were evaluated and contaminants of concern were selected based on carcinogenicity, detection frequency, comparison with background concentrations, toxicity, physicochemical properties, concentration, and grouping chemicals by similar characteristics. Based on this analysis, the following chemicals were selected as contaminants of concern at the Acme site:

GROUNDWATER	SOILS
VOCs	VOCs
1,1,1-trichloroethane	1,1,1-trichloroethane
1,1-dichloroethene	1,2-dichloroethene (cis and trans)
1,2-dichloroethene (cis and trans)	tetrachloroethene
1,1-dichloroethane	trichloroethene
benzene	ethylbenzene
chloroform	total xylenes
tetrachloroethene	
trichloroethene	
vinyl chloride	
SVOCs	SVOCs
naphthalene	bis(2-ethylhexyl)phthalate

Pesticides/PCBs	Pesticides/PCBs
none	Arochlor 1254
Inorganics	Inorganics
none	lead

Toxicity Assessment

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for particular contaminants to cause adverse effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and/or severity of adverse effects, including carcinogenic and noncarcinogenic effects.

Ten of the fifteen contaminants of concern are carcinogens. USEPA's Guidelines for Carcinogen Risk Assessment uses a two-part evaluation in assessing the toxicity of carcinogens, first assigning a weight of evidence classification, which evaluates the sufficiency of data regarding a contaminant's carcinogenicity, and then developing a cancer potency factor (CPF) based on available information about dose response relationships for that carcinogen. CPFs, which are expressed in $(mg/kg/day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper bound estimate of the excess lifetime cancer risk associated with exposure at the intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. CPFs are derived from results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied. The weight of evidence classification and CPF for each of the indicator contaminants is shown in Table 3.

Ten of the fifteen contaminants of concern have noncarcinogenic toxic effects. USEPA has developed chronic reference doses (RfDs) to indicate the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied. These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse health effects to occur. RFDs for noncarcinogenic effects for the contaminants of concern are shown in Table 3.

TABLE 3

TOXICITY ASSESSMENT
ACME SOLVENT RECLAIMING, INC. CONTAMINANTS OF CONCERN

CONTAMINANT	Weight of evidence classification[1]	Oral CPF $(mg/kg/day)^{-1}$	Oral RfD mg/kg/day
VOCs			
benzene	A	2.9×10^{-2}	
chloroform	B2	6.1×10^{-3}	
1,1-dichloroethane	B2	9.1×10^{-2}	0.1
1,1-dichloroethene	C	0.6	9×10^{-3}
1,2-dichloroethene (cis and trans)			0.02[2]
ethylbenzene			0.1
tetrachloroethene	B2	5.1×10^{-2}	0.01
1,1,1-trichloroethane	D		9×10^{-2}
trichloroethene	B2	1.1×10^{-2}	
vinyl chloride	A	2.3	
total xylenes			2
SVOCs			
bis(2-ethylhexyl)phthalate	B2	0.014	0.02
naphthalene			0.4
Pesticides/PCBs			
Arochlor 1254	B2	7.7	
Inorganics			
lead	B2	NA	NA

[1] USEPA's weight of evidence system classifies carcinogens as follows:
- A: Human carcinogen
- B1: Probable human carcinogen (limited human data available)
- B2: Probable human carcinogen (sufficient animal data, inadequate human data)
- C: Possible human carcinogen
- D: Not classifiable as to human carcinogenicity

[2] derived from an adjusted acceptable daily intake of 350 ug/l

NA = not available

It is important to note that risks due to exposure to lead in soils and waste areas were not evaluated because USEPA has not developed a CPF or RfD for lead. Until a CPF or RfD is developed, USEPA is using the Agency for Toxic Substances and Disease Registry's finding that lead levels of 500 to 1,000 mg/kg in soils can cause increased blood lead levels in children as a basis for assessing risks due to lead. Lead concentrations in waste areas and in some other site soils exceed 1,000 mg/kg and thus may result in adverse health effects under the scenarios discussed below.

Exposure Assessment

The exposure assessment identified potential pathways for contaminants of concern to reach the receptors and the estimated contaminant concentration at the point of exposure. Estimated exposures to soil and groundwater were calculated based on a reasonable maximum exposure (RME) scenario, in accordance with the National Contingency Plan (NCP, 40 CFR Part 300), and an average exposure scenario, under both current and projected future land use conditions. The exposure pathways evaluated in the EA are summarized in Table 4.

Current-Use Conditions - Residential and Agricultural

Land around the Acme site is predominately used for agriculture and low-density, single-family homes. Twenty-four homes have been identified along Baxter, Edson, and Lindenwood Roads near the Acme site (see Fig. 5). All use private wells for water supply, and those along Lindenwood and Edson Roads are downgradient of waste disposal areas. Five residences have well water contaminated with VOCs at levels exceeding USEPA's Health Advisories. These residences were supplied with bottled water in 1981 and with HCTUs in 1987. Two residences with HCTUs also continue to receive bottled water under a voluntary agreement with Pagel's Pit Landfill operators.

The current-use exposure assessment evaluated dermal, oral, and inhalation exposure to groundwater for cooking, drinking water, and other domestic uses such as showering. Use of water for lawns, agricultural land, fruits and vegetables, and care of domestic livestock was also evaluated. Use of well water with and without treatment by HCTUs was evaluated.

Current-Use Conditions - Recreational

The exposure assessment evaluated migration of contaminated groundwater to Killbuck Creek and potential dermal contact through swimming and fishing, or oral exposure through incidental ingestion of surface water or consumption of fish. Trespassing on-site would result in dermal, inhalation, and ingestion exposures to on-site soils.

TABLE 4

POTENTIAL EXPOSURE PATHWAYS QUANTIFIED UNDER THE CURRENT- AND FUTURE-USE SCENARIOS

Exposure Pathway	Exposure Medium	Exposure Route
<u>Residential Setting</u>		
Untreated Drinking Water	Water	Ingestion
Domestic Untreated Water Use	Air	Inhalation
<u>Agricultural Setting</u>		
Beef Consumption	Food	Ingestion
Dairy Consumption	Food	Ingestion
<u>Recreational Setting</u>		
Swimming in Kishwaukee River	Water	Ingestion
Swimming in Kishwaukee River	Water	Dermal Contact
Fish From Killbuck Creek	Food	Ingestion
<u>On-Site Setting</u>		
Airborne VOC and Particulates	Air	Inhalation
Airborne Particultes	Air	Ingestion
Soil	Soil	Dermal Contact
Soil	Soil	Ingestion
Untreated Drinking Water*	Water	Ingestion
Domestic Untreated Water Use*	Air	Inhalation

* for future-use scenarios only

Future-Use Conditions

The future-use scenario evaluated future migration of contaminants to the existing homes through a groundwater model using the same exposure scenarios described above. In addition, potential dermal, inhalation, and ingestion exposures to on-site soil and groundwater if a residence were constructed on the site were evaluated. This future-use scenario is consistent with current land use near the site and zoning restrictions, which allows one single family dwelling per 40 acres.

Chronic daily intakes of contaminants were calculated for the exposure pathways described above using methods described in RAGS and further detailed in the Acme Solvents EA.

Risk Characterization

The risk characterization combines the chronic daily intakes developed in the exposure assessment with the toxicity information collected in the toxicity assessment to assess potential human health risks from contaminants at the site. For carcinogens, results of the risk assessment are presented as an excess lifetime cancer risk, or the probability that an individual will develop cancer as a result of a 70-year lifetime exposure to site contaminants. These risks are probabilities that are generally expressed in scientific notation (e.g. 1×10^{-6} or 1E-06). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of exposure to conditions at a site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) (or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple exposures within a single medium or across media.

Results of the risk characterization are detailed in Table 5 and discussed below. Although both reasonable maximum exposure (RME) and average case scenarios were developed for the EA, only the RME will be discussed, because the NCP requires that the RME be used in developing protective exposure levels.

Current-Use Conditions

The greatest calculated potential risk under current-use conditions was from drinking and domestic use of untreated

TABLE 5

SUMMARY OF POTENTIAL RISKS
THEORETICAL UPPER-BOUND EXPOSURE

Exposure Pathway	Exposure Route	Risk from A Carcinogen	Risk from B2 Carcinogen	Risk from C Carcinogen	Total Cancer Risk	Chronic Hazard Index	Source Risk Table
RESIDENTIAL -- CURRENT							
Drinking Untreated Supply	Ingestion	5E-05	8E-06	4E-06	6E-05	1.5E-01	5-4
Domestic Untreated Supply Use	Inhalation	1E-04	2E-05	8E-06	1E-04	3.0E-01	NA
AGRICULTURAL -- CURRENT							
Beef Consumption	Ingestion	2E-10	1E-09	9E-12	2E-09	2.0E-05	5-5
Dairy Consumption	Ingestion	8E-11	5E-10	4E-11	7E-10	8.7E-03	5-6
RECREATION -- CURRENT DRAFT							
Swimming in Kishwaukee	Ingestion	5E-15	3E-13	NAR	3E-13	1.1E-08	5-8
Swimming in Kishwaukee	Dermal Contact	3E-15	2E-13	NAR	2E-13	1.9E-09	5-9
Fish from Killbuck	Ingestion	2E-09	3E-07	NAR	3E-07	2.4E-02	5-10
ON-SITE -- CURRENT							
Airborne VOC/Particulates	Inhalation	NAR	6E-09	NAR	6E-09	9.8E-03	5-12
Airborne Particulates	Ingestion	NAR	3E-08	NAR	3E-08	1.8E-05	5-13
Soil	Dermal Contact	NAR	1E-06	NAR	1E-06	1.2E-03	5-14
Soil	Ingestion	NAR	3E-07	NAR	3E-07	7.0E-04	5-15
COMBINED RESIDENTIAL -- CURRENT*							
Untreated Supply	Multiple	2E-04	3E-05	1E-05	2E-04	4.8E-01	NA
OFF-SITE RESIDENTIAL -- FUTURE							
Drinking Untreated Supply	Ingestion	5E-04	1E-05	2E-06	5E-04	2.6E-01	5-16
Domestic Untreated Supply Use	Inhalation	1E-03	2E-05	4E-06	1E-03	5.2E-01	NA
OFF-SITE AGRICULTURAL -- FUTURE							
Beef Consumption	Ingestion	2E-09	2E-09	4E-12	4E-09	2.7E-05	5-17
Dairy Consumption	Ingestion	8E-10	7E-10	1E-11	1E-09	1.1E-02	5-18
OFF-SITE RECREATION -- FUTURE							
Swimming in Kishwaukee	Ingestion	1E-11	1E-12	NAR	1E-11	6.2E-08	5-19
Swimming in Kishwaukee	Dermal Contact	7E-12	6E-13	NAR	8E-12	1.0E-08	5-20
Fish from Killbuck	Ingestion	1E-05	1E-06	NAR	1E-05	1.4E-01	5-21
ON-SITE RESIDENTIAL -- FUTURE							
Airborne VOC/Particulates	Inhalation	NAR	3E-06	NAR	3E-06	6.7E-02	5-22
Airborne Particulates	Ingestion	NAR	1E-05	NAR	1E-05	8.0E-03	5-23
Soil	Dermal Contact	NAR	3E-05	NAR	3E-05	3.7E-02	5-24
Soil	Ingestion	NAR	9E-06	NAR	9E-06	2.1E-02	5-25
Drinking Untreated Water	Ingestion	1E-02	5E-04	1E-04	1E-02	9.6E+00	5-26
Domestic Untreated Water Use	Inhalation	2E-02	1E-03	2E-04	2E-02	1.9E+01	NA
COMBINED RESIDENTIAL -- FUTURE*							
Untreated Supply -- Off-Site	Multiple	2E-03	3E-05	6E-06	2E-03	9.3E-01	NA
Untreated Supply -- On-Site	Multiple	3E-02	2E-03	3E-04	3E-02	2.9E+01	NA

* Combined pathways include all residential + agricultural + fish consumption.
NA = Not applicable
NAR = No applicable risk

groundwater at the homes along Lindenwood Road. Inhalation and ingestion exposures to contaminated well water result in a lifetime excess cancer risk of 1.6×10^{-4}. Vinyl chloride contributes more than 81 percent of this risk, with the remaining VOCs accounting for the remaining risk.

For on-site (trespassing) exposures, incidental ingestion and dermal contact with soil contribute more than 98 percent of the total lifetime excess cancer risk of 1.3×10^{-6}, primarily because of exposure to PCBs. Inhalation exposure pathways were insignificant.

Risks from swimming and fishing in Killbuck Creek were insignificant, as were risks from consumption of agricultural products.

Future-Use Conditions

If no action were taken to prevent exposure to or migration of contaminated groundwater (i.e., the HCTUs were discontinued), the lifetime excess cancer risk from ingestion and inhalation exposure would increase to 1.5×10^{-3} for the homes along Lindenwood Road. Again, most of this risk is from vinyl chloride.

If a home with a private well were built on-site, residents would be exposed to a lifetime excess cancer risk of 3×10^{-2}, mainly from ingestion and inhalation exposure to groundwater contaminated with vinyl chloride. Potential risks from dermal contact and incidental ingestion of soils would result in a lifetime excess cancer risk of 4.9×10^{-5}, mainly from exposure to PCBs. Future on-site residents would also be exposed to noncarcinogenic adverse health effects, particularly from inhalation exposure to 1,2-dichloroethene during household use of well water.

Consumption of agricultural products and swimming in Killbuck Creek result in insignificant risk, however, the lifetime excess cancer risk for ingestion of fish caught in Killbuck Creek if contaminated groundwater continues to migrate towards the creek is 1×10^{-5}.

Risks due to Waste Areas

Risks due to exposure to the waste pile left from the 1986 cleanup (see Fig. 2) were developed separately using the methods described above. Exposure scenarios and risk calculations are shown in Table 6. The lifetime excess cancer risk due to dermal contact and incidental ingestion of soils is 3.8×10^{-5} for the current use (trespassing) scenario and 1.2×10^{-3} for the future-use (residential use of site) scenario, mainly due to exposure to PCBs. Carcinogenic risks from exposure to waste areas were

TABLE 6

WASTE AREA RISK ASSESSMENT SUMMARY

EXPOSURE PATHWAYS QUANTIFIED UNDER
THE CURRENT- AND FUTURE-USE SCENARIOS

EXISTING ON-SITE WASTE MOUND SOILS

Exposure Pathway	Exposure Medium	Exposure Route
Airborne VOC and Particulates	Air	Inhalation
Airborne Particulates	Air	Ingestion
Soil	Soil	Dermal Contact
Soil	Soil	Ingestion

SUMMARY OF POTENTIAL RISKS
EXISTING ON-SITE WASTE MOUND SOILS

THEORETICAL UPPER BOUND EXPOSURE

Exposure Pathway	Exposure Route	Total Cancer Risk	Chronic Hazard Index
ON-SITE — CURRENT			
Airborne VOC/Particulates	Inhalation	8E-07	2.6
Airborne Particulates	Ingestion	1E-09	NA
Soil	Dermal Contact	3E-05	NA
Soil	Ingestion	7E-06	NA
ON-SITE RESIDENTIAL — FUTURE			
Airborne VOC/Particulates	Inhalation	7E-05	2.6
Airborne Particulates	Ingestion	1E-05	NA
Soil	Dermal Contact	9E-04	NA
Soil	Ingestion	2E-04	NA

greater than one order of magnitude higher than those for other on-site soils. Under both scenarios, inhalation exposure to airborne contaminants from the waste areas (particularly xylenes) could result in noncarcinogenic adverse health effects.

Risks from exposure to northwest area soils were not evaluated because analytical data were not available at the time the EA was written but are expected to be similar to those for the waste pile. Risks due to the approximately 8,000 gallons of liquids and sludges in the tanks on-site were not evaluated. The tanks are securely closed, so the potential for human or animal exposure to the contents is low. However, the tanks are partially buried, and the potential for leaks or ruptures is unknown.

Environmental Risks

Two types of ecosystems are found around the Acme Solvents site, the tall prairie grassland ecosystem (comprising most of the Acme Solvents site) and the riparian forest ecosystem (including the ecosystem around Killbuck Creek). Chemicals detected in surface soils at the Acme Solvents site may enter into the food chain of the grassland ecosystem via ingestion by earth burrowing organism, such as earthworms, and/or uptake by grass roots, and may bioaccumulate. Information necessary to assess potential adverse environmental effects due to direct or indirect exposure to contaminants was not available. However, the lack of large quantities of remaining chemical-affected soils indicates that the potential for environmental risk is low. Also, groundwater modelling data indicate that concentrations of contaminants entering Killbuck Creek from groundwater are low, therefore, adverse effects to the aquatic ecosystem are also expected to be low.

According to information from the Winnebago County Forest Preserve, no threatened, rare, or endangered species and/or associated habitats are known to exist on or near the Acme Solvents site.

The results of the EA show that actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

VII. DESCRIPTION OF ALTERNATIVES

Based on the findings of the STI and EA, the following remedial action objectives were developed for the Acme Solvents site:

- Reduce human health risks due to dermal, ingestion, or inhalation exposure to contaminants in the two 8,000-gallon tanks, the waste pile remaining from the 1986 PRP cleanup, and to the soils/sludges in the northwest area of the site, as well as all other contaminants remaining in soils after the 1986 cleanup.

- Reduce the potential for mobile contaminants, especially VOCs, in soils and waste areas to migrate and further contaminate groundwater.

- Remediate contaminated groundwater outside of waste areas to meet ARARs and health-based levels, and provide a long-term alternate water supply to homes with contaminated wells.

- Reduce the potential for migration of VOCs from bedrock gas to groundwater.

Remedial action alternatives to meet these objectives were developed in two documents: an EE/CA addresses the tanks and waste areas; and a RAAE addresses all other site contamination. Two documents were written because USEPA and IEPA intend to remediate the tanks and waste areas as quickly as possible, prior to the remediation of other less highly contaminated areas. The two sets of alternatives are discussed separately below. Alternatives involving the waste areas and tanks will be referred to as Phase I alternatives, and alternatives involving other areas will be referred to as Phase II alternatives.

Phase I: Waste Area Alternatives

The eight remedial alternatives that were considered for the waste pile, the two tanks, and the sludges in the northwest area ("source areas") of the site (see Fig. 2) are described below. Detailed information about the alternatives is presented in the EE/CA. Approximately 6,000 tons of soils and sludge are present in the two waste areas, and 8,000 gallons of liquid and sludge are present in the tanks. All outlined cleanup alternatives can be constructed within 1 year of startup.

The tanks and waste areas meet the conditions set forth in the NCP for a non time-critical removal action, and were intended to be addressed as a removal prior to ROD signature. In accordance with the NCP, an EE/CA was written to evaluate cleanup alternatives. Because the EE/CA was not completed until August 1990, the Agency's selected remedy for this waste area has been incorporated into this ROD.

Common Elements

All Phase I alternatives, except no action, include treating the liquid and sludge contained in the two tanks by off-site incineration and landfilling of the tanks. Both the landfill and the incinerator will be permitted under the Resource Conservation

TABLE 7

TREATABILITY VARIANCE LEVELS FOR ACME SOIL AND DEBRIS[1]

Structural Functional Group	Acme Site Contaminant	Maximum Conc. (mg/kg)	Range to be Achieved
PCBs	PCBs	290	90 - 99.9 % reduction
Halogenated Aliphatics	1,2-Dichloroethene	44	95 - 99.9 % reduction
	Trichloroethene	4.5	0.5 - 2 mg/kg
	Tetrachloroethene	31	0.5 - 2 mg/kg
Non Polar Aromatics and Heterocyclics	Ethylbenzene	290	90 - 99.9 % reduction
	Total Xylenes	1,500	90 - 99.9 % reduction
Other Polar Organics	Bis(2-ethylhexyl) phthalate	1,300	90 - 99.9 % reduction
Inorganics	Arsenic	20.9	0.27 - 1 mg/l (TCLP)
	Barium	1,190	0.1 - 40 mg/l (TCLP)
	Chromium	54,900	0.5 - 6 mg/l (TCLP)
	Lead	52,500	0.1 - 3 mg/l (TCLP)

[1]Source: OSWER Directive No. 9347.3-06FS. Treatability variance levels were calculated based on STI sampling data. These levels should be recalculated if predesign sampling shows different contaminants of concern or maximum concentrations.

and Recovery Act (RCRA). The estimated cost of the tank removal is $379,000.

Under all alternatives except those that call for off-site disposal of treatment residuals, surface water diversions, such as trenches and berms, would be constructed to reduce water runon and infiltration. All Phase I alternatives can be constructed in one year.

Wastes originally disposed of at Acme Solvents, and now mixed with soil and debris, include still bottoms from a solvent reclaiming operation. Although all disposal occurred prior to the enactment of RCRA, if the wastes were generated today, they would be classified as F001 - F005 listed waste. In addition, some of the highly contaminated soils and sludges may be RCRA characteristic due to TCLP toxicity. RCRA regulations are therefore applicable to remedial action alternatives which would constitute placement of a RCRA waste, but are not applicable to alternatives which treat waste in-situ.

Because existing and available data do not demonstrate that the treatment processes under consideration can consistently attain RCRA LDR standards for all soil and debris wastes to be addressed under Phase I, the alternatives will comply with LDRs through a Treatability Variance. The treatment level range established through a Treatability Variance that these technologies would attain for Acme indicator parameters is shown in Table 7.

No Action

As described in the EA and EE/CA for the Acme Solvents site, the presence of high levels of VOCs, SVOCs and PCBs in the waste areas could present an appreciable health risk if left unremediated. The exposure pathways contributing most significantly to the risk are: inhalation of VOCs, dermal contact with PCBs, and incidental ingestion of PCBs. VOCs would also continue to migrate to groundwater if the waste areas were not remediated.

Alternative 1: Soil vapor extraction, RCRA cap, surface water diversions.

Alternative 1 provides for extracting VOCs using in-situ soil vapor extraction (SVE). SVE would consist of drilling a series of wells into the soil mound and in the northwest portion of the site, to bedrock (approximately 25 feet). Extracted air would be vented through activated carbon to remove VOCs. When the SVE has eliminated 90 to 95 percent of the VOCs, the SVE system would be removed. A RCRA Subtitle C compliant cap would then be installed over the areas to prevent direct contact with residual contamination, including SVOCs, PCBs, and metals, and to reduce migration of the remaining VOCs to groundwater.

Because soils would not be excavated, RCRA Subtitle C closure requirements would not be applicable; however, a RCRA Subtitle C compliant cap is proposed to maximize infiltration reduction.

Total present net worth (PNW) cost of Alternative 1: $1,036,000

Alternative 2: Soil vapor extraction, in-situ solidification, surface water diversions.

Alternative 2 includes installation of an SVE system, as described in Alternative 1, to eliminate 90 to 95 percent of the VOCs. Alternative 2 would then use in-situ solidification to immobilize PCBs, SVOCs, and metals such as lead. A specifically designed drilling rig would inject solidification materials through the center of the augers and mix them with contaminated soils. Treatability studies would be necessary to determine the effectiveness of solidification on organic contaminants.

As in Alternative 1, RCRA closure requirements would not be considered applicable to this action because all materials would be treated in-situ.

Total PNW cost of Alternative 2: $1,173,000

Alternative 3: Excavation, chemical oxidation, solidification, followed by (a) off-site disposal or (b) on-site placement and surface water diversions.

Alternative 3 provides for excavating soils and sludges and then treating the wastes by chemical oxidation to destroy VOCs, SVOCs, and PCBs. The chemical oxidation system being evaluated, for which a preliminary treatability test has been conducted, uses hydrogen peroxide and a catalyst to break down organic chemicals. This oxidation process would be performed in a reactor equipped with vapor-phase activated carbon to capture emitted volatiles. The remaining treatment residue would then be solidified to immobilize metals such as lead. Further treatability studies would be required to determine whether these technologies would be effective on site contaminants, especially PCBs.

Following solidification, the treated waste would be disposed of using one of two alternatives. Alternative 3a calls for off-site disposal of treated material at a RCRA-permitted hazardous waste landfill. Alternative 3b, on-site placement and surface water diversions, calls for leaving treated material on-site and imposing runon and infiltration controls to minimize the potential for contaminant migration.

Because Alternative 3 calls for excavation and treatment and disposal of soil contaminated with RCRA waste, RCRA LDRs would be applicable. Thus, this alternative must, at a minimum, meet the Treatability Variance standards for soil and debris (see Table 7).

RCRA Subtitle C closure requirements must also be met in Phase II if treatment residuals are placed on-site (Alternative 3b).

Total PNW cost of Alternative 3a: $7,990,000
Total PNW cost of Alternative 3b: $6,390,000

Alternative 4: Excavation, soil washing, off-site treatment and disposal of washing liquids and contaminants, followed by (a) off-site soil disposal or (b) on-site placement and surface water diversions.

Alternative 4 provides for the excavation of soils and sludges, followed by a multistage soil-washing treatment process to remove VOCs, SVOCs, PCBs, and metals. Batches of contaminated soil would be mixed with surfactants and washing fluids. Washing liquids would be treated and contaminants would ultimately be taken off-site for treatment or disposal in compliance with RCRA Subtitle C. Treatability studies would be necessary to determine the effectiveness of the soil-washing process.

Two alternatives were evaluated for disposal of washed soils. Alternative 4a, off-site disposal, calls for off-site disposal of washed soils at a RCRA-permitted hazardous waste landfill. Alternative 4b calls for placing washed soils on-site and implementing runon and infiltration controls to minimize the potential for residual contaminant migration. Applicability of RCRA requirements would be the same as for Alternative 3.

Total PNW cost of Alternative 4a: $6,080,000

Total PNW cost of Alternative 4b: $4,680,000

Alternative 5: Excavation, followed by (a) off-site disposal or (b) low-temperature thermal stripping and off-site disposal.

Alternative 5 provides for excavating soils and sludges. Alternative 5a, off-site disposal, calls for transporting contaminated soils and sludges directly to a RCRA permitted hazardous waste landfill. Alternative 5b calls for volatilization of organic contaminants through a low-temperature thermal stripping (LTTS) process and then off-site transport and disposal of the treated waste. Soils and sludges would be heated to approximately 350° to 800° F to volatilize VOCs and SVOCs. Units operating at temperatures at the high end of that range can also volatilize PCBs. Offgases resulting from the thermal treatment process would either be collected and condensed or passed through a high-temperature afterburner. Treatability studies would be required to evaluate the efficiency of the process in removing SVOCs and PCBs. Metals would not be treated.

Under Alternative 5b, treated soils would be placed on-site, and runon and infiltration controls would be implemented to minimize the potential for residual contaminant migration.

As in Alternative 3, RCRA LDRs would be applicable to this alternative. Alternative 5a would not meet RCRA LDR requirements. If Alternative 5b is selected, RCRA Subtitle C closure will be required in Phase II.

Total PNW cost of Alternative 5a: $1,900,000

Total PNW cost of Alternative 5b: $3,400,000

Alternative 6: Excavation, on-site incineration, surface water controls, and (a) on-site placement or (b) solidification and on-site placement.

Alternative 6 provides for excavating contaminated material and incinerating materials on-site to destroy PCBs, VOCs, and SVOCs. After incineration, residuals would be placed on-site (Alternative 6a), or residuals would be solidified to immobilize metals and then placed on-site (Alternative 6b). Surface water controls would be installed to reduce water runon. A mobile incinerator would be brought on-site, and a trial burn would be performed to demonstrate compliance with RCRA and the Toxic Substances Control Act (TSCA), including a 99.9999 percent destruction removal efficiency for PCBs. Treated soils would be placed on-site, and runon and infiltration controls would be implemented to minimize the potential for residual contaminant migration. Because most metals cannot be destroyed through incineration, residuals placed on-site under Alternative 6a would contain some metals; however, solidification (Alternative 6b) should effectively immobilize heavy metals.

RCRA LDRs and Subtitle C closure requirements must be met for both Alternatives 6a and 6b. Alternative 6a may not meet these requirements, depending on the level of metals remaining in residuals.

Total PNW cost of Alternative 6a: $13,000,000

Total PNW cost of Alternative 6b: $14,000,000

Alternative 7: Excavation, off-site incineration.

Alternative 7 provides for excavating contaminated material, loading contaminated material into drums, and transporting drums off-site to a RCRA- and TSCA-permitted hazardous waste incinerator. Residuals would be placed in an off-site RCRA-permitted hazardous waste landfill. Excavated areas would be backfilled with clean soil.

As in Alternative 3, RCRA LDRs and Subtitle C closure requirements will also be applicable for this alternative. Residuals may have to be solidified off-site to meet RCRA requirements.

Total PNW cost of Alternative 7: $13,000,000

Alternative 8: Excavation, low-temperature thermal stripping, solidification, followed by (a) off-site disposal or (b) on-site placement and surface water diversions.

Alternative 8 provides for excavating soils and sludges and then treating them through the LTTS system described under Alternative 5b. Residuals would then be solidified, if necessary, to immobilize metals.

Alternative 8a, off-site disposal, calls for off-site disposal of treatment residuals at a RCRA-permitted hazardous waste landfill. Alternative 8b calls for on-site placement of treatment residuals and imposing runon and infiltration controls to minimize the potential for contaminant migration.

As in Alternative 3, RCRA LDRs and Subtitle C closure requirements would be applicable for Alternative 8b. Thus this alternative must, at a minimum, meet the Treatability Variance standards for soil and debris (see Table 7).

Total PNW cost of Alternative 8a: $4,300,000

Total PNW cost of Alternative 8b: $2,700,000

<u>Phase II: Remaining Soil, Bedrock, and Groundwater Alternatives</u>

Six remedial alternatives are being considered for cleaning up the remaining soil, bedrock, and groundwater contamination. In general, the alternatives become increasingly complex and build upon previous alternatives to provide more comprehensive approaches to site remediation. Further information about these alternatives is presented in the RAAE.

Common Elements

Except for the no action alternative, all alternatives contain common elements, as discussed below. All alternatives provide for two types of cap, a RCRA Subtitle C compliant cap or a 12-inch soil cover. These options are provided because the selection of Phase I cleanup alternative will, in part, determine whether or not RCRA ARARs are triggered and Subtitle C closure is required. All Phase II alternatives include site fencing to ensure the integrity of the cap or cover and deed notices or advisories to restrict use of the site and to restrict use of on- and off-site contaminated groundwater until cleanup levels are attained. Under all alternatives, the affected residences would be provided with a permanent alternate water supply from the Pagel's Pit deep well or from a new water supply well in the St. Peter Sandstone aquifer (see Fig. 5). All alternatives, including no action, include long term groundwater monitoring.

All cost estimates are based on 30 years of operation and maintenance. For Alternatives 2 through 6, a cost range is given in the RAAE, depending on the type of cap chosen (as discussed above) and the level of protection chosen, which ranges from a lifetime excess cancer risk of 1×10^{-4} to 1×10^{-6}. In the discussion below, a range from the least to most expensive option is given.

Groundwater soil areas and volumes used in cost estimates for the various levels of protection and bedrock gas mass estimates are shown on Figures 6 and 7 and Table 8. These estimates are based on limited data; further sampling will be necessary to refine these estimates.

Alternative 1: No further action.

Under Alternative 1, no action would be taken to clean up the contaminated soil, bedrock, and groundwater remaining after the Phase I cleanup. Groundwater monitoring wells would be sampled at least twice a year for a minimum of 5 years. At least every 5 years, a risk analysis would be performed to evaluate the site's threat to public health and the environment.

Total PNW cost of Alternative 1: $2,900,000

Alternative 2: Soil cover or RCRA cap, permanent alternate water supply, and long-term monitoring.

Alternative 2 involves consolidating soil contaminated with lead, SVOCs, and PCBs (approximately 33,000 ft^2; see Figures 6 and 7) and covering it with a 12-inch soil cover or RCRA Subtitle C compliant cap. The capped areas would be revegetated, and the site would be fenced. Deed restrictions would also be imposed. Groundwater and VOC-contaminated soils would not be treated under this alternative. As in Alternative 1, monitoring wells would be sampled for at least 5 years to estimate contaminant attenuation and migration.

The total PNW cost of Alternative 2 ranges from $3,700,000 (to achieve 10^{-4} risk using a soil cover) to $6,830,000 (to achieve 10^{-6} risk using a RCRA cap).

TABLE 8

GROUNDWATER, SOIL AND BEDROCK GAS VOLUME ESTIMATES

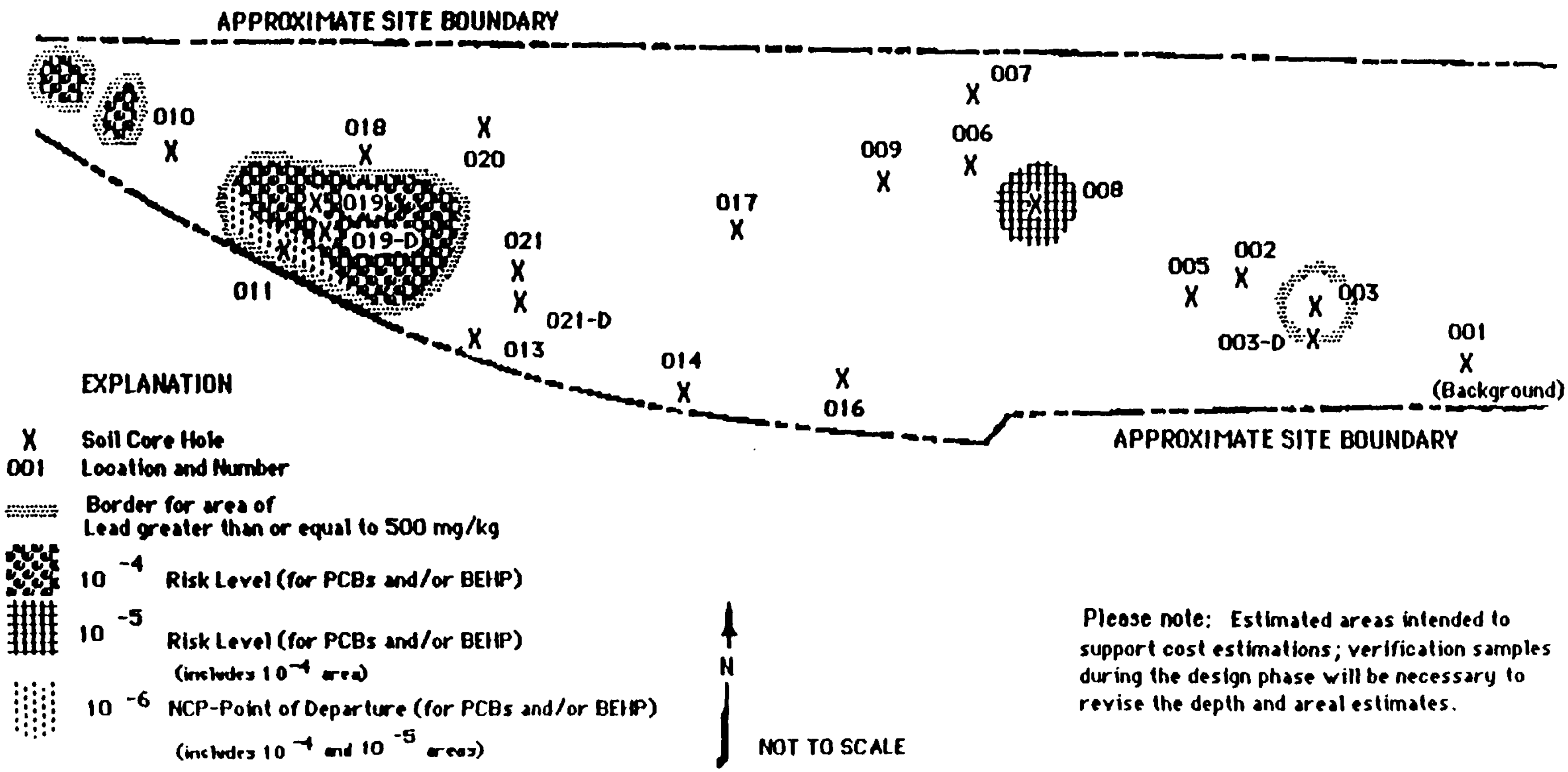
	risk level		
Groundwater volume	10^{-4}	10^{-5}	10^{-6}
area (ft^2)	1.4×10^5	4.3×10^6	6.3×10^6
volume (gallons)	5.8×10^6	1.8×10^8	2.6×10^8
Soil volume			
immobile contaminants[1] (lead, BEHP, PCBs)			
area (ft^2)	28,000	33,000	33,000
mobile and immobile contaminants[2] (BEHP, PCBs, VOCs)			
volume (yd^3)	4,800	8,600	9,100

Bedrock gas (mass)	average case estimate[4]	worst case estimate
bedrock gas (lbs)[3]	391	6800

[1] used for cap and soil cover cost estimates
[2] used for treatment cost estimates
[3] estimated mass of VOCs in bedrock gas
[4] used in SVE cost estimates

Figure 6

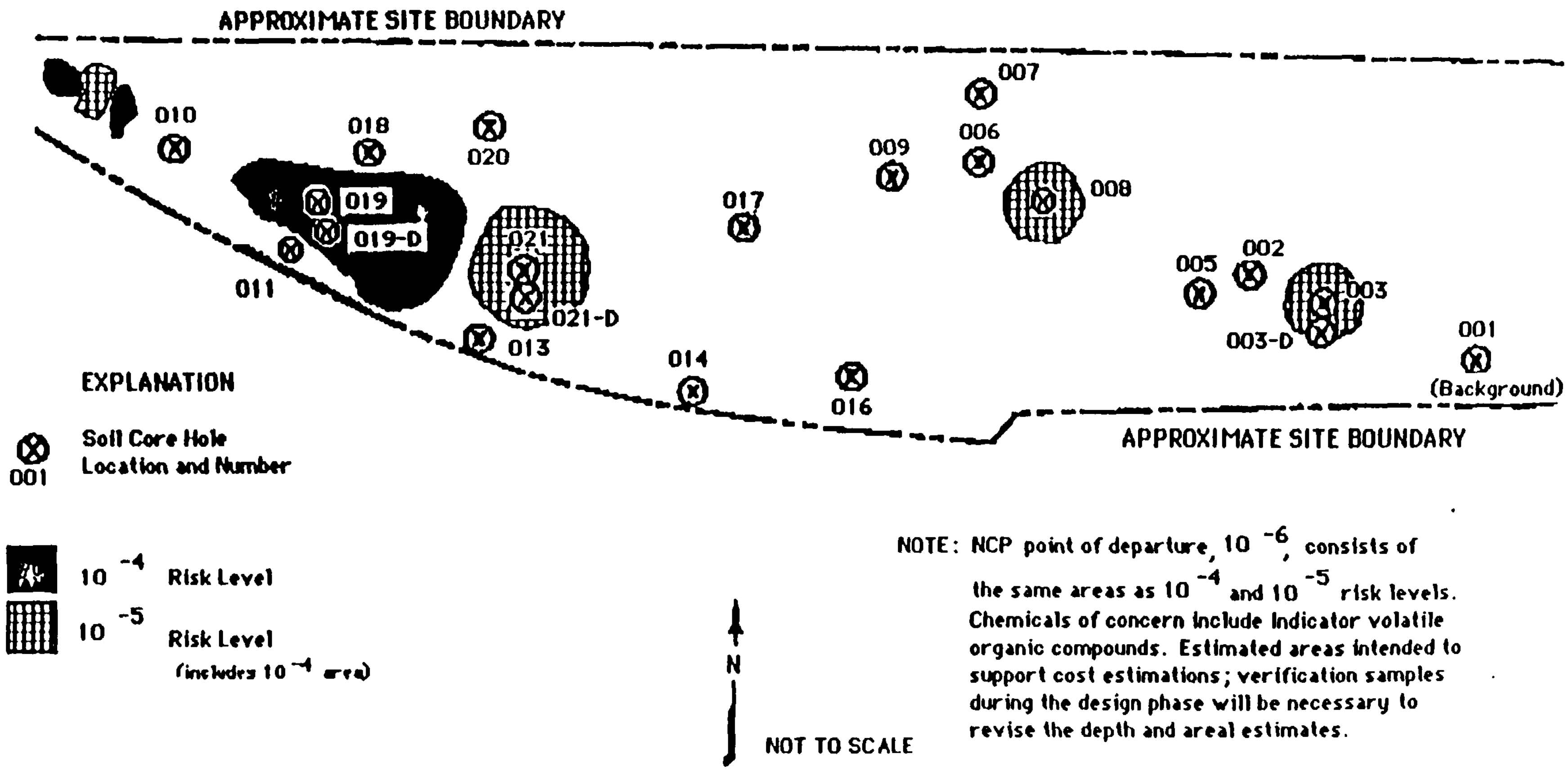
Estimated Extent of Residual Soil Exceeding Action Levels for the Surficial Pathway
Acme Solvents Reclaiming, Inc.



Please note: Estimated areas intended to support cost estimations; verification samples during the design phase will be necessary to revise the depth and areal estimates.

Figure 7

Estimated Extent of Residual Soil Exceeding Action Levels for Groundwater Chemicals of Concern
Acme Solvents Reclaiming, Inc.



NOTE: NCP point of departure, 10^{-6}, consists of the same areas as 10^{-4} and 10^{-5} risk levels. Chemicals of concern include indicator volatile organic compounds. Estimated areas intended to support cost estimations; verification samples during the design phase will be necessary to revise the depth and areal estimates.

Alternative 3: Soil cover or RCRA cap, permanent alternate water supply, long-term monitoring, and low-temperature thermal stripping.

Alternative 3 includes all components of Alternative 2 and adds LTTS to treat VOC-, SVOC-, and PCB-contaminated soil. The volume of soil to be treated ranges from 4,800 to 9,100 cy, depending on the level of protection chosen (see Table 8 and Figs. 6 and 7). The LTTS process is described on page 16 under Phase I Alternative 5. Although this technology has been proven effective for removing VOCs, treatability studies would be conducted to evaluate its efficiency in removing SVOCs and PCBs. Metals such as lead would not be treated. Treated soil would be disposed of off-site in a RCRA Subtitle C compliant landfill or returned to the excavated areas.

Because Alternative 3 calls for excavation and treatment of soil contaminated with RCRA waste, RCRA Subtitle C closure requirements would be applicable if residuals are disposed of on-site. Thus, this alternative must include a RCRA Subtitle C compliant cap to comply with ARARs if soils are disposed on-site but may include a soil cover if materials are disposed off-site, and if the selected Phase I alternative does not include on-site disposal. Also, treatment by LTTS must, at a minimum, meet the Treatability Variance standards for soil and debris (Table 7), in order to comply with RCRA LDRs.

All components of Alternative 3 can be completed within one year. The total PNW cost of Alternative 3 ranges from $9,400,000 (for 10^{-4} risk and off-site disposal) to $14,210,000 (for 10^{-6} risk and off-site disposal).

Alternative 4: Soil cover or RCRA cap, permanent alternate water supply, long-term monitoring, groundwater pump and treat, and discharge of treated effluent.

Alternative 4 includes all components of Alternative 2 but adds extraction and treatment of VOC-contaminated groundwater. Volumes of groundwater to be remediated to achieve various levels of protection are presented in Table 8. Extracted water would be treated by air stripping or an equivalent technology and discharged to Killbuck Creek or the intermittent stream that crosses the site. Treatability studies may be required to design the groundwater treatment system. Offgasses would be treated if emissions from the air stripper exceeded health-based levels or ARARs. Soils would not be treated under this alternative but would be consolidated and covered with a soil cover or RCRA cap.

The area of remediation for groundwater pump and treat extends from the boundary of the waste areas (essentially equivalent to the site boundary) to the edge of the VOC plume. Groundwater contamination at the southeast corner of Pagel's Pit Landfill would be excluded, as discussed in Section IV. Groundwater cleanup would meet or exceed maximum contaminant levels (MCLs) set under the Safe Drinking Water Act (SDWA) and non-zero MCL Goals (MCLGs). Discharge of treated groundwater must meet National Pollutant Discharge Elimination System (NPDES) limits set under the Clean Water Act (CWA).

Groundwater pump and treat would require 15 to 30 (or more) years to achieve remediation goals. All other components of Alternative 4 can be completed within one year. The cost of Alternative 4 ranges from $5,780,000 (for soil cover and 10^{-4} level of protection) to $10,203,000 (for RCRA cap and 10^{-6} level of protection).

Alternative 5: Soil cover or RCRA cap, permanent alternate water supply, long-term monitoring, groundwater pump and treat, and soil and bedrock vapor extraction.

Alternative 5 includes all components of Alternative 4 but adds vapor extraction to remove VOCs from soil and bedrock. Vapor extraction uses pumps connected to extraction wells to draw VOCs through the air spaces between soil particles and in bedrock. The vacuum established by the extraction wells draws VOC-contaminated air from the soil pores and draws fresh air from the soil surface down to the soil. The areas and volumes of soil and bedrock to be remediated are shown in Figure 7 and Table 8. If air emissions from the vapor extraction system exceeded health-based levels (based on the 10^{-4} to 10^{-6} carcinogenic risk range) or ARARs, offgases would be treated. Vapor extraction is a proven technology in soils, but pilot studies would be needed to determine its effectiveness in bedrock. Soils contaminated with SVOCs, PCBs, and lead would not be treated under this alternative but would be consolidated and covered with the soil cover or RCRA cap.

Because this alternative involves in-situ treatment, RCRA LDRs and closure requirements would only be applicable if required by the selected Phase I alternative.

It is estimated that the soil/bedrock vacuum extraction system would be operated for two to five years. The groundwater pump and treat system would require 15 to 30 (or more) years of operation to achieve remediation goals. All other components of Alternative 5 can be completed in one year. The PNW cost of Alternative 5 ranges from $7,948,000 (for a 10^{-4} level of protection and soil cover) to $12,475,000 (for a 10^{-6} level of protection and RCRA cap).

Alternative 6: Permanent alternate water supply, groundwater pump and treat, soil and bedrock vapor extraction, and (a) low-temperature thermal stripping or (b) off-site incineration and disposal.

Alternative 6 includes all components of Alternative 5 but adds treatment of SVOC- and PCB-contaminated soils by two alternative treatment technologies. In Alternative 6a, soils exceeding the selected risk level would be treated by LTTS as in Alternative 3. Residuals would be disposed of on-site and covered with a RCRA cap or disposed of off-site in a RCRA-permitted hazardous waste landfill. In Alternative 6b, soils exceeding the selected risk level would be incinerated off-site in a RCRA-permitted incinerator. Residuals would be disposed of off-site in a RCRA-permitted hazardous waste landfill.

Because Alternative 6 calls for excavation and treatment of soil contaminated with RCRA waste, RCRA Subtitle C closure requirements would be applicable if residuals are disposed of on-site. Thus, this alternative must include a RCRA Subtitle C compliant cap to comply with ARARs if soils are disposed on-site but may include a soil cover if materials are disposed of off-site and if the selected Phase I alternative does not include on-site disposal. Also, treatment by LTTS must, at a minimum, meet the Treatability Variance standards for soil and debris (Table 7) in order to comply with RCRA LDRs. Treatment by incineration must achieve a 99.9999 percent destruction removal efficiency for PCBs as required under RCRA.

The vacuum extraction system would be operated for two to five years. The groundwater pump and treat system would require 15 to 30 (or more) years to achieve remediation goals. All other components of Alternative 6 can be completed in one year.

The cost of Alternative 6a ranges from $13,335,000 (to achieve a 10^{-4} risk level with off-site disposal of residuals) to $19,186,000 (to achieve a 10^{-6} risk level with off-site disposal of residuals).

The cost of Alternative 6b ranges from $25,406,000 (to achieve a 10^{-4} risk level with off-site disposal of residuals) to $42,140,000 (to achieve a 10^{-6} risk level with on-site disposal of residuals).

VIII. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP requires that alternatives be evaluated on the basis of nine criteria: overall protection of human health and the environment; compliance with applicable, or relevant and appropriate, requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility, and volume (TMV) through treatment; short-term effectiveness; implementability;

cost; state acceptance; and community acceptance. This section compares Phase I and Phase II alternatives with respect to these criteria.

Threshold Criteria

Overall Protection of Human Health and the Environment

Phase I: All source area alternatives meet the CERCLA minimum requirement for protecting human health and the environment. Those alternatives that involve off-site landfilling of treated or untreated wastes and sludges (Alternatives 3a, 4a, 5a, 5b, 7, and 8a) provide the best overall protection because contaminants are completely removed from the site. Those alternatives that treat all contaminants before on-site landfilling (Alternatives 3b, 4b, 6, 8b) provide slightly less overall protection, although risk based cleanup levels must be met before treated material could be landfilled on-site. Those alternatives that treat only a portion of the contaminants (Alternatives 1 and 2) provide less overall protection.

Phase II: All Phase II alternatives (except no action) protect human health and the environment by providing a permanent alternate water supply to affected residents and treating or containing remaining contaminants in soil. The alternatives providing for both soil and groundwater treatment (Alternatives 5 and 6) provide the best overall protection. Alternatives 2 and 3 provide little protection to future groundwater users because no groundwater treatment is included.

For both Phase I and Phase II, the no action alternative is not protective of human health and the environment. The no action alternative will not be considered further in this analysis.

Compliance with ARARs

Phase I: The most important ARARs associated with the Phase I cleanup are RCRA and TSCA requirements. All alternatives meet these requirements except Alternative 5a, as discussed below. RCRA LDRs (40 CFR Part 268) require treatment of hazardous substances before landfilling. LDR requirements will be met through a Treatability Variance. All alternatives requiring excavation and treatment (Alternatives 3 through 8) require treatability testing to ensure that RCRA LDR Treatability Variance standards (see Table 7) can be met. Alternatives that include on-site landfilling of residuals (Alternatives 3b, 4b, 6a, 6b, and 8b) also require RCRA Subtitle C closure as part of the Phase II cleanup. Alternatives which include off-site landfilling of residuals (Alternatives 3a, 4a, 5a, and 8a) must meet all Federal and State permit requirements for landfilling hazardous waste. Alternatives 1 and 2 are not required to meet RCRA LDR standards because materials would be treated in-situ. Alternative 5a would not meet LDRs because the materials would be landfilled off-site without treatment. This was prohibited after expiration of the national capacity extension for CERCLA soil and debris on November 8, 1990.

The TSCA PCB spill cleanup policy (40 CFR 761) is a "to be considered" (TBC) criterion for this cleanup. This policy requires that spills resulting in PCB contamination of greater than 50 ppm be cleaned up to a level of 10 ppm and covered with at least 10 inches of clean soil. All alternatives except 1 and 2 meet this criterion; however, treatability studies will be required to ensure that residuals from some of the treatment technologies can meet the 10-ppm cleanup level.

Phase II: RCRA and TSCA regulations are also important ARARs for the Phase II cleanup, as are MCLs and MCLGs set under the Safe Drinking Water Act (SDWA) (40 CFR 141 and 143) and NPDES limits set under the CWA. All Phase II alternatives will meet MCLs and non-zero MCLGs at the point of exposure through provision of an alternate water supply; however, Alternatives 2 and 3 will not meet these ARARs in the aquifer. Alternatives 4, 5, and 6 must meet NPDES limits, and utilize the best available demonstrated control technology (BAT) for treatment and discharge of groundwater to surface water.

RCRA requirements will dictate which of the site capping options (soil cover or RCRA Subtitle C compliant cap) is selected, and LDRs will set minimum standards for excavated and treated materials. Alternatives 3 and 6, which include excavation and treatment of soils, must meet Treatability Variance standards for soil and debris in order to meet the requirements of RCRA LDRs. If, under the Phase I or Phase II cleanup, treatment residuals are to be landfilled on-site, the RCRA compliant cap option must be selected under Phase II in order to meet RCRA Subtitle C closure and post closure requirements.

All Phase II alternatives meet the requirements of the TSCA PCB spill cleanup policy, as discussed above.

Primary Balancing Criteria

Long-Term Effectiveness and Permanence

Phase I: Alternatives 6 and 7 (on- and off-site incineration) provide the best long term effectiveness and permanence. All other Phase I alternatives require treatability studies to assess this criterion; however, the alternative that relies on capping to prevent exposure to some contaminants (Alternative 1) provides less permanence than those that treat all contaminants. Because Phase I is not intended to provide the final solution for the site, this criterion is more important for Phase II than for Phase I.

Phase II: All alternatives include a soil cover or RCRA compliant cap that provides adequate long-term effectiveness for contaminants in surface soils as long as the cover or cap is maintained. Those alternatives providing for treatment of contaminants in groundwater, soils, and bedrock, in addition to the soil cover or cap (Alternatives 5 and 6) provide the best long-term effectiveness and permanence. Alternative 2 with the soil cover option provides the least permanence because the soil cover would be largely ineffective in preventing migration of VOCs to groundwater.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Phase I: Those alternatives involving technologies that treat all site contaminants (VOCs, SVOCs, PCBs, and metals), Alternatives 3, 4, 6, 7, and 8, provide the best reduction of TMV.

Alternatives that treat only some of the contaminants, such as Alternatives 1, 2, and 5b, provide less reduction of TMV. Alternative 5a provides no reduction of TMV.

Phase II: Of the Phase II alternatives, Alternative 6 best reduces TMV through treatment because all contaminants that exceed risk-based levels would be treated. Alternative 5 provides slightly less reduction of TMV because remaining SVOCs and PCBs would be capped rather than treated. Alternatives 4, 3, and 2 provide progressively less reduction of TMV.

Short-Term Effectiveness

Phase I: All source area alternatives can be completed within 1 year. The alternatives that do not involve soil excavation (Alternatives 1 and 2) provide the best protection of workers and the community during the remedial action. For all other alternatives that involve soil excavation, emission controls and dust suppression would be used if necessary to protect workers and the community during implementation.

Phase II: All alternatives can be constructed in less than 1 year; however, groundwater cleanup under Alternatives 4, 5, and 6 requires 15 to 30 (or more) years to complete. Soil vapor extraction may take 2 to 5 years to complete. As with the source area alternatives, the Phase II alternatives that do not require a large amount of excavation (Alternatives 2, 4, and 5) provide the best protection of the community and workers during construction; however, emission controls and other measures would be used as necessary to ensure protection from emissions during construction.

Implementability

Phase I: Many alternatives, including Alternatives 2, 3, 4, 5b, and 8, require treatability studies to ensure their effectiveness in treating the contaminants at the site. Incineration (Alternatives 6 and 7), if followed by solidification of the ash, is a proven technology for treating the site contaminants; however, a trial burn is required by RCRA regulations prior to use of an on-site mobile incinerator. No treatability studies would be needed for Alternatives 1 and 5a. Most of these technologies are readily available, although the capacity of on-site and off-site incinerators is limited, as is the capacity of RCRA-permitted landfills.

Phase II: Most Phase II alternatives under consideration use well established, conventional, and widely available technologies. However, treatability studies would be required for alternatives that include LTTS (Alternatives 3 and 6a). Also, vacuum extraction of bedrock contaminants has not been widely implemented. Bedrock vapor extraction requires pilot studies to assess its feasibility before this technology could be implemented at the Acme Solvents site.

Cost

Phase I: The source area alternatives can be ranked by cost as follows: Alternative 1 is least expensive, followed by Alternatives 2, 5a, 8b, 5b, 8a, 4b, 4a, 3b, 3a, 7, and 6. Technology costs range from $1,040,000 for SVE followed by capping, to $13,100,000 for on-site incineration.

Phase II: Phase II alternatives can be ranked by cost as follows: Alternative 2 is least expensive, followed by Alternatives 4, 3, 5, 6a, and 6b. Costs range from $4,173,000 for Alternative 2 at the 10^{-4} cleanup level to $42,140,000 for Alternative 6b at the 10^{-6} cleanup level.

<u>**Modifying Criteria**</u>

State Acceptance

IEPA has been involved throughout this and previous investigations of the Acme Solvents site and supports the selected remedies (discussed below) for both the Phase I and Phase II cleanups.

Community Acceptance

Community acceptance of the Phase I and II selected remedies is discussed in the Responsiveness Summary, which is attached as Appendix B.

IX. THE SELECTED REMEDY

Based on the information collected and developed in the STI, EA, EE/CA, and RAAE, and using the comparative analysis of alternatives described above, USEPA and IEPA have selected Phase I Alternative 8 and Phase II Alternative 5 as the most appropriate remedial actions at the Acme Solvent Reclaiming, Inc. site. This section contains a detailed description of the components of the selected remedies. A flow chart showing the basic elements of the Phase I and Phase II remedies is shown in Fig. 8.

PHASE I: SOURCE AREAS

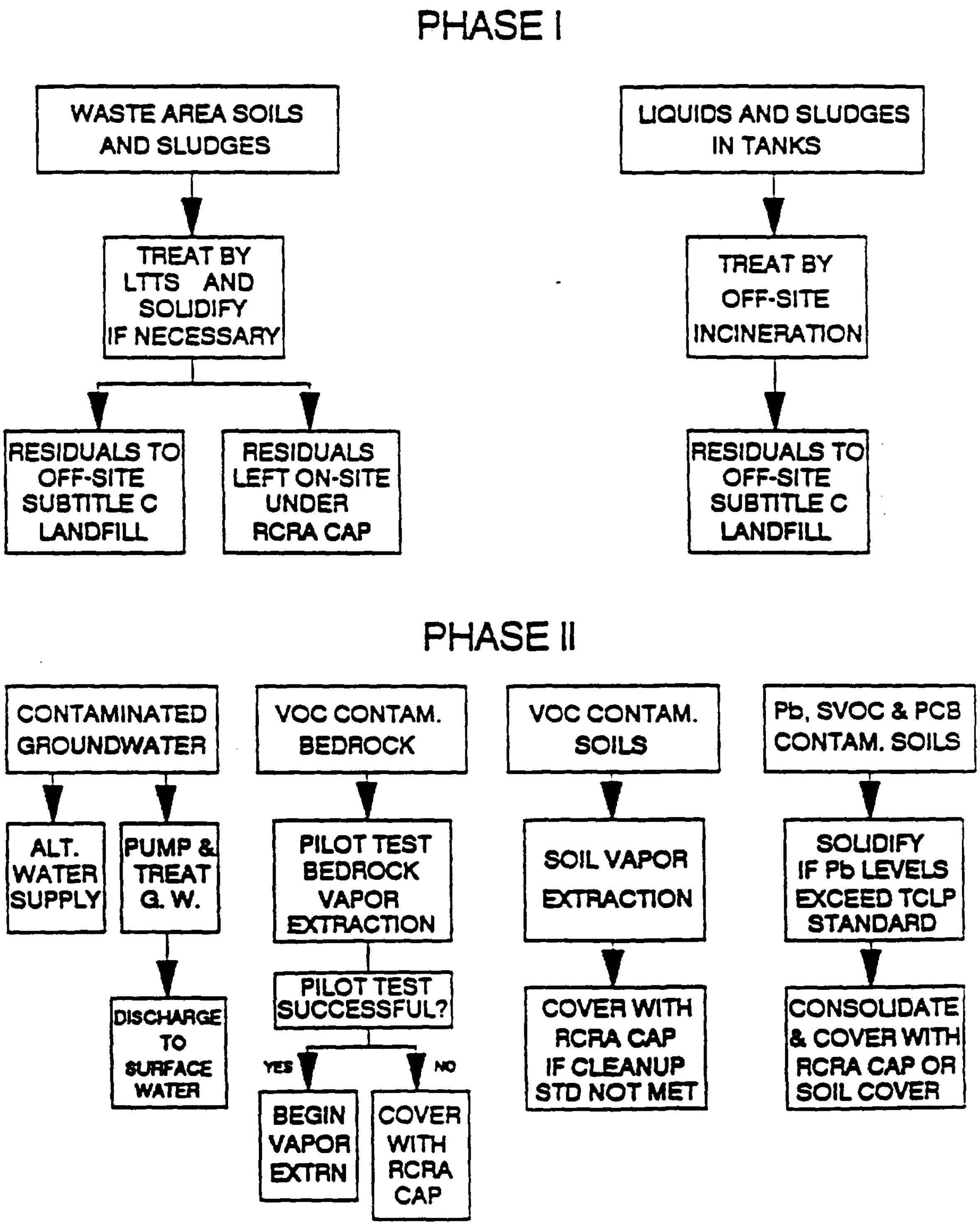
The approximately 4,000 tons of soil and sludge in the waste areas and the approximately 2,000 tons of soil and sludge in the northwest area will be excavated and treated on-site by LTTS. Residuals from offgas treatment will be treated or disposed of as RCRA hazardous waste. Offgases from the LTTS process will be collected and condensed, or destroyed in a high temperature afterburner, if necessary to meet emissions standards discussed on page 31.

The two tanks remaining on-site will be emptied and disposed of in a RCRA Subtitle C compliant landfill or decontaminated and disposed of as nonhazardous waste. Soils under and around the tanks will be tested and treated by LTTS if they exceed the cleanup standards set forth in the following paragraph. The approximately 8,000 gallons of liquids and sludges in the tanks will be sent for treatment to an off-site RCRA- and TSCA-permitted incinerator. The incinerator operator will be responsible for disposing of the residuals in a manner consistent with RCRA Subtitle C.

The area to be excavated will be delineated in the field using a photoionization device (PID). A reading of 10 ppm above background will define the limits of excavation. All waste area materials exceeding 10 ppm PCBs must also be excavated and treated. Additional characterization of the waste areas will be performed to show whether the field delineation method described above will meet the 10 ppm PCB criterion or whether additional measures will be necessary to delineate areas contaminated above 10 ppm PCBs.

Residuals from the LTTS process must, at a minimum, meet the Treatability Variance standards for soil and debris set under RCRA LDRs (40 CFR 268) and listed in Table 7. Residuals will be further treated by solidification/stabilization, if necessary, to meet these standards. Treatability studies will be performed in the design phase to ensure that these standards can be met by this technology. Residuals that meet these standards can be landfilled off-site in a RCRA Subtitle C permitted hazardous

FIGURE 8
ACME SOLVENTS PHASE I AND PHASE II
SELECTED REMEDIES



waste landfill, as long as all other State and Federal requirements for landfilling hazardous waste are met.

If residuals are landfilled on-site, Treatability Variance standards must be met, as well as additional standards to ensure protection against direct contact threat and to prevent migration of contaminants remaining in residuals to groundwater. In addition, residuals must be covered by a RCRA Subtitle C compliant cap to meet RCRA ARARs. The column entitled "multimedia cap with FML" in Table 9 shows VOC cleanup standards for LTTS residuals to be landfilled on-site. In addition, PCBs must be treated to 10 mg/kg.

Table 10 provides a detailed cost estimate for the Phase I cleanup. The total cost of the Phase I selected remedy ranges from $3,079,000 to $4,679,000.

PHASE II: REMAINING SOILS, BEDROCK, AND GROUNDWATER

The selected Phase II remedy includes a RCRA compliant cap, permanent alternate water supply, long-term monitoring, groundwater pump and treat, and soil and bedrock vapor extraction.

Groundwater

A water main will be extended from the Pagel's Pit water supply well or from a new deep well to the residences within the 10^{-5} carcinogenic risk plume and those whose wells may become contaminated in the future. The HCTUs will be removed when the water main is completed.

A groundwater pump and treat system will be installed to capture all groundwater outside the site boundary that exceeds MCLs, proposed MCLs, or non-zero MCLGs. The MCL for 1,1-dichloroethene (1,1 DCE) was not used, for the reasons discussed below. A cumulative carcinogenic risk of 1×10^{-5} or a cumulative HI of 1 were used to develop cleanup standards for 1,1 DCE and contaminants without MCLs. Table 11 shows cleanup standards for indicator parameters. MCLs and a 10^{-5} risk level were selected because concentrations at the 10^{-6} and 10^{-5} levels are below reasonably achievable detection levels for many of the contaminants of concern and because of the technical difficulties associated with aquifer restoration in fractured bedrock.

The NCP calls for use of MCLs and MCLGs when setting standards for aquifer-restoration, except in cases where the MCLG is zero, or where the attainment of MCL's would result in a cumulative carcinogenic risk outside of the 10^{-4} to 10^{-6} risk range. If the MCL for 1,1 DCE were used, the cumulative carcinogenic risk for all contaminants would be greater than 3×10^{-4}. Therefore, the cleanup standard for 1,1 DCE was set at the 10^{-5} risk level. The use of MCLs and 10^{-5} risk as discussed above results in a

TABLE 9

SOIL CLEANUP STANDARDS FOR VOCS

Compound	Soil Cover (ug/kg)	Multimedia Cap with FML (ug/kg)
1,1,1-Trichloroethane	7,300	64,000
1,1-Dichloroethene	0.8	6.9
1,1-Dichloroethane	2.4	21
1,2-Dichloroethene	1,430	13,000
Benzene	7.9	69
Tetrachloroethene	140	1,200
Trichloroethene	16	140
Vinyl Chloride	0.6	.52
4-Methyl-2-pentanone	723	6,100
Naphthalene	4,550	40,000

Notes:

FML = Flexible membrane liner

Soil cleanup standards were developed using the Summers Leach Model to determine a VOC concentration in soils that would ensure VOC concentrations in groundwater would not exceed a 1×10^{-5} carcinogenic risk level. USEPA's Hydrologic Evaluation of Landfill Performance (HELP) model was used to calculate the infiltration reduction provided by the soil cover and multimedia cap. Further information is provided in the RAAE. Cleanup standards for the multimedia cap have been reduced by a factor of 10 because the HELP model assumes perfect performance of the multimedia cap and has not been field verified.

Soil cleanup standards below detection levels (DLs) using USEPA approved methods for low level analysis of soils may be modified.

TABLE 10
page 1 of 3

COST ESTIMATE FOR THE SELECTED PHASE I REMEDY
LTTS/SOLIDIFICATION/OFF-SITE DISPOSAL

	Capital Cost	Annual Cost
Technology Costs		
Soil Excavation	$ 170,000	
Off-Site RCRA Landfill	$ 950,000	
Transportation to Off-Site Landfill	$ 330,000	
Low-Temperature Thermal Stripping	$ 750,000 $125/ton unit cost	$ 200,000
Solidification (6000 tons soil)	$ 510,000	
Subtotal	$ 2,700,000	$ 200,000
Site Costs		
Site Preparation	$ 20,000	
Site Administration	$ 18,000	
Insurance and Permit Renewal		$ 30,000
Subtotal	$ 38,000	$ 30,000
Indirect Costs		
Administration		$ 35,000
Contingencies		$ 35,000
Subtotal		$ 70,000
Construction Subtotal	$ 2,700,000	
Bid Contingencies	$ 540,000	
Scope Contingencies	$ 670,000	
Construction Total	$ 3,900,000	
Permitting and Legal Costs	$ 61,000	
Services During Construction	$ 75,000	
Subtotal	$ 140,000	
Total Capital Cost:	$ 4,000,000	
Total Annual Cost:		$ 300,000

Total PNW Cost (1 year): $ 4,300,000

Notes:

Costs developed by USEPA's Cost of Remedial Action (CORA) model

All costs are rounded to two significant figures.

The cost estimates shown are based on the data input to the program and cost algorithms developed for generic conditions. The final costs will depend on actual size, design, and market conditions. As a result, the final project costs will vary from the estimates presented here.

COST ESTIMATE FOR THE SELECTED PHASE I REMEDY
LTTS/SOLIDIFICATION/ON-SITE PLACEMENT

	CAPITAL COST		ANNUAL COST	
Technology Costs				
Soil Excavation	$ 170,000			
Solidification	$ 510,000			
Low-Temperature Thermal Stripping	$ 750,000		$ 200,000	
Surface Water Diversion/Collection	$ 24,000		$ 700	
Subtotal		$ 1,500,000		$ 200,000
Site Costs				
Site Administration	$ 20,000			
Insurance and Permit Renewal			$ 30,000	
Subtotal		$ 20,000		$ 30,000
Indirect Costs				
Administration			$ 35,000	
Contingencies			$ 35,000	
				$ 70,000
Construction Subtotal		$ 1,500,000		
Bid Contingencies		$ 300,000		
Scope Contingencies		$ 460,000		
Construction Total		$ 2,300,000		
Permitting and Legal Costs	$ 36,000			
Services During Construction	$ 50,000			
Subtotal		$ 86,000		
Total Capital Cost:		$ 2,400,000		
Total Annual Cost:				$ 300,000

Total PNW Cost (1 year): $ 2,700,000

Notes:

Costs developed using USEPA's Cost of Remedial Action (CORA) model.

All costs are rounded to two significant figures.

The cost estimates shown are based on the data input to the program and cost algorithms developed for generic conditions. The final costs will depend on actual size, design, and market conditions. As a result, the final project costs will vary from the estimates presented here.

Engineering Cost Estimate for Incineration of
Tank Materials and Tank Disposal

Site preparation	$	10,000
Packing		120,000
Transportation		1,000
Incineration		180,000
Tank disposal		6,000
Plans, permits, and regulatory fees		62,000
	$	379,000

Assumptions for cost:

Site preparation will be concluded within four days and includes labor, rental equipment, and chemical stabilization.

Packing will be concluded within 15 days and includes labor, rental equipment, health and safety equipment, decontamination procedures and disposal, and drum costs.

Transportation will be concluded within one day and includes labor and transportation for three truckloads to CID.

Incineration will include 60 tons of material, as estimated from 8000 gallons with a density of 1.8 grams per cubic centimeter.

Tank disposal will be concluded within two days and includes labor, rental equipment, disposal, and transportation costs to CID.

Plans, permits, and regulatory fees includes management of task operations, finalizing documents necessary to task actions, and negotiations with regulatory agencies.

cumulative carcinogenic risk within the 10^{-4} to 10^{-6} risk range required by the NCP.

The cleanup standard selected for the alternate water supply (10^{-5} carcinogenic risk) is more stringent than the standard selected for the groundwater pump and treat system (10^{-5} risk only for 1,1 DCE and contaminants without MCLs) because the alternate water supply addresses actual exposures, while the groundwater pump and treat system addresses potential exposures. MCLs and 10^{-5} carcinogenic risk represent practically achievable cleanup standards for the groundwater pump and treat portion of the remedy given the difficulties of aquifer restoration in fractured bedrock.

The area of attainment for groundwater cleanup levels extends from the downgradient site boundary (the point of compliance) to the downgradient edge of contamination. Groundwater will be treated by air stripping, followed by carbon adsorption, if necessary (or an equivalent technology), and then discharged in accordance with NPDES discharge limits to Killbuck Creek or the intermittent stream that crosses the site.

The Galena-Platteville aquifer has been classified as a Class II aquifer under USEPA's Groundwater Protection Strategy and is widely used as a source of drinking water. The proposed remediation is consistent with USEPA's goal of returning usable aquifers to their beneficial uses within a reasonable time frame. However, because the Galena-Platteville Dolomite is a fractured bedrock formation, an extended period will be required to achieve aquifer remediation; the actual time required for remediation is uncertain. Groundwater modelling has estimated that remediation can be achieved in 15 to 30 years, however, experience at other Superfund sites indicates that models underestimate aquifer remediation times; the actual remediation time may be longer.

During the 15 to 30 (or more) years of aquifer remediation, the groundwater pump and treat system will be monitored and adjusted as warranted by the performance data collected during operation. Adjustments to the operating system may include discontinuing operation of extraction wells in areas where cleanup goals have been attained; alternating pumping at wells to eliminate stagnation points; and pulse pumping to allow aquifer equilibration and encourage adsorbed contaminants to partition into groundwater.

Soil and Bedrock

Soil/Bedrock Vapor Extraction

VOCs remaining in soil and bedrock after the Phase I cleanup will be treated by vapor extraction. A pilot test will be performed to assess the feasibility of bedrock vapor extraction. If the pilot

TABLE 11

GROUNDWATER CLEANUP STANDARDS

Compound	Cleanup Standard ug/1	Basis
1,1,1-Trichloroethane	200	MCL
1,1-Dichloroethene	0.2	1 x 10^{-5} carcinogenic risk
1,1-Dichloroethane	2	1 x 10^{-5} carcinogenic risk
1,2-Dichloroethene	70	MCLG for cis-1,2-DCE
Benzene	5	MCL
Tetrachloroethene	5	Proposed MCL
Trichloroethene	5	MCL
Vinyl chloride	2	MCL
4-Methyl-2-pentanone	125	cumulative HI of 1
Naphthalene	20	cumulative HI of 1

Notes:

This table shows cleanup standards for indicator parameters only. The general cleanup standards described in the text must be met for all groundwater contaminants.

Groundwater cleanup standards below DLs using USEPA approved methods for analysis of drinking water may be modified.

tests are successful, bedrock vapor extraction will be implemented under former waste disposal areas. Soil vapor extraction will be implemented in areas where VOCs in soil exceed the cleanup standards set forth in Table 9. As with the groundwater pump and treat system, the vapor extraction system will be monitored and adjusted as warranted by performance data collected during its operation. Adjustments may be similar to those cited for pump and treat.

Solidification

Lead-contaminated soils will be tested for leachability and will be solidified if the extract exceeds the 5 ppm RCRA TCLP lead standard. Disposal of solidified material will be as described for Phase I residuals.

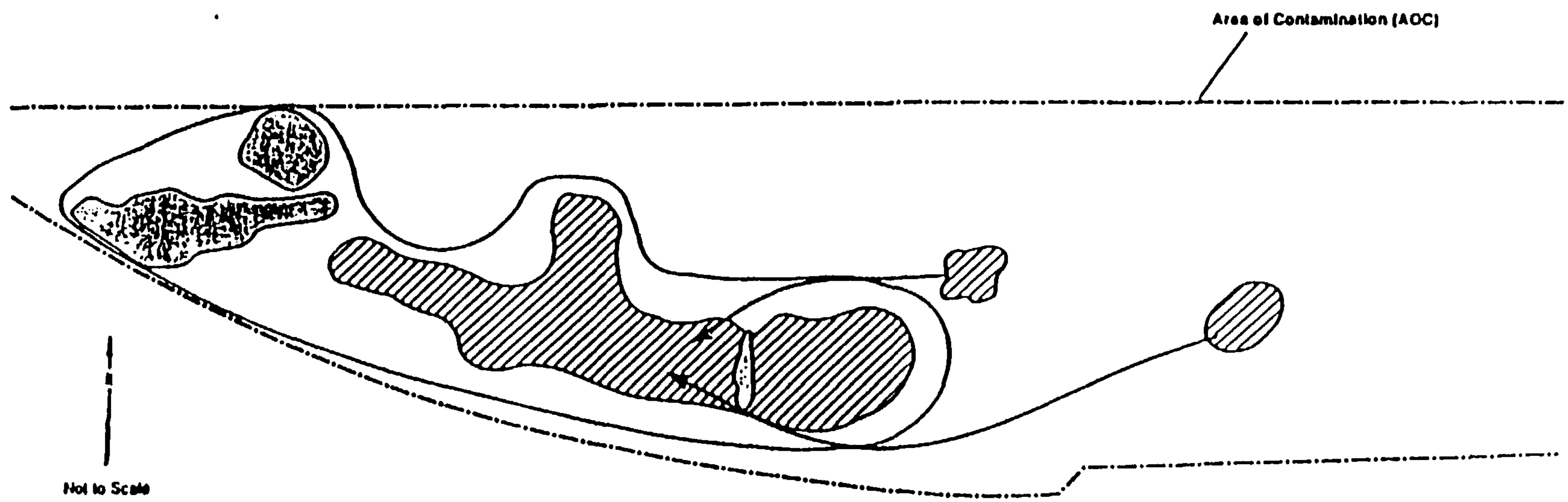
RCRA Compliant Cap or Soil Cover

All areas in where materials are treated and backfilled on-site under the Phase I or Phase II cleanups will be covered with a RCRA Subtitle C compliant cap. In addition, any soils which exceed the VOC standards entitled "soil cover" in Table 9 after completion of SVE must be covered with a RCRA compliant cap. A RCRA compliant cap may also be required over all former waste areas if pilot testing shows that bedrock vapor extraction will not be effective in removing VOCs from bedrock. Soils which pose a direct contact threat will also be covered, as discussed below.

If no residuals are landfilled on-site (or if residuals can be delisted under RCRA), and if SVE is successful in treating VOCs in soils to levels at or below the standards set forth in the "soil cover" column in Table 9, a 12-inch soil cover may be placed on the site, rather than a RCRA compliant cap.

Soils containing contaminants that may pose a threat through direct contact will also be consolidated and capped. Because these contaminants are relatively immobile, a RCRA compliant cap is required only if the conditions set forth in the preceding paragraphs are not met. If those conditions are met, a 12-inch soil cover may be placed over these soils. The cleanup standards for direct contact threat are based on the 10^{-5} carcinogenic risk level developed in the Acme Solvents EA and the USEPA policies for PCB and lead action levels (OSWER Directive No. 9355.4-01 and 9355.4-02). Cleanup standards for contaminants which pose a direct contact threat are as follows: bis(2-ethylhexyl)phthalate - 58 mg/kg; PCBs - 1 mg/kg; and lead - 500 mg/kg.

Because the success of the treatment technologies and further testing in the design phase will determine the type and location of the RCRA cap, the exact location of the cap will not be specified in this ROD. Figure 9 is a conceptual drawing showing areas which may be capped.



EXPLANATION

- Approximate Location of Areas Addressed in the EE/CA; Area Estimated to be Approximately 2 Acres
- Approximate Location of Areas Addressed in the RAAE; Area Estimated to be Approximately 3 Acres
- Area Considered Under Capping Alternatives; Area Estimated to be Approximately 6 Acres
- Persons To be Consolidated for Capping

Conceptual Configuration, Not for Design

Harding Lawson Associates Engineering and Environmental Services		EE/CA and RAAE Areas of Concern Acme Solvents Reclaiming, Inc., Site Winnebago County, Illinois		FIGURE 9
DRAWN RLB	JOB NUMBER 17683.026.10	APPROVED	DATE 9/90	REVISED DATE

A 10^{-5} cumulative carcinogenic risk level was selected for all portions of the soil cleanup because many VOC concentrations at the 10^{-6} risk level are below reasonably achievable detection levels. The VOC cleanup standards in soils are based on achieving 10^{-5} cumulative carcinogenic risk in the aquifer, a more stringent standard than for aquifer remediation. Because of the difficulties associated with aquifer remediation in fractured bedrock, a higher level of treatment of soil contaminants which may migrate and further contaminate groundwater is necessary to ensure protection of the aquifer.

Air Emissions, Monitoring, and Institutional Controls

Air emissions from excavation and treatment processes will be monitored. These processes include air stripping, soil and bedrock vapor extraction, soil excavation and consolidation, and the Phase I LTTS process. Offgas treatment or other corrective actions will be used if total air emissions from the site exceed an excess cancer risk of 1×10^{-5} for downgradient residences or workers at Rockford Blacktop Quarry, the nearest receptors.

The remedy will also include (1) long-term groundwater monitoring to ensure that action levels are being met, (2) site fencing and deed restrictions to prevent use of shallow groundwater under the site and to protect the soil cover, and (3) to the extent possible, deed notices or advisories will be provided to protect off-site users of groundwater until cleanup levels are met.

Construction of the water main can be started while the Phase I cleanup is being implemented. All other construction will start after Phase I is completed. The Phase II construction may take less than 1 year. Approximately 2 to 5 years may be required to remove contaminants through SVE; however, the groundwater cleanup may continue for 15 to 30 (or more) years. A cost estimate for the remedy is provided in Table 12. The total present worth cost for the Phase II cleanup is estimated at $11,933,000.

The total present worth cost for the Phase I and Phase II cleanups ranges from $15,012,000 to $16,612,000.

X. DOCUMENTATION OF SIGNIFICANT CHANGES

A Proposed Plan, which described USEPA's and IEPA's preferred alternative for remediation of the Acme Solvents site, was released for public comment in October 1990. The Agencies reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as described in the Proposed Plan, were necessary. However, a few minor changes were made to the proposed remedy were made, as discussed below.

TABLE 12

COST ESTIMATE FOR THE SELECTED PHASE II REMEDY
RCRA CAP, PUMP AND TREAT, SVE

ITEM	CAPITAL COST	ANNUAL COST
Mobilization	$ 201,500	$ 8,600
Alternate Water Supply	$ 85,600	$ 6,000
Groundwater Monitoring		$ 247,400
Multimedia Cap	$ 1,800,000	$ 38,000
Groundwater Treatment (60 gpm)	$ 257,700	$ 88,400
Soil/Bedrock Vapor Extraction		
Shallow Soils	$ 130,000	$ 70,000
Bedrock	$ 531,400	$ 142,000
Pilot Testing	$ 65,000	
Total Vapor Extraction	$ 726,700	$ 212,000[1]
Groundwater Extraction Wells	$ 24,000	$ 8,000
Demobilization	$ 42,000	
Subtotal Capital Costs	$ 3,134,500	
Engineering and Design (17%)	$ 532,900	
Construction Management (10%)	$ 313,500	
Contingency (30%)	$ 940,500	
Total Capital Cost:	$ 4,921,400	
Total Annual Cost:		$ 608,400

Total PNW Cost (30 years): $ 11,933,000

1 SVE - 5 years maximum operation

Note: Actual costs may vary from -30 to +50 percent of values presented because of uncertainties in rate and cost factors. Additional variations in costs may also be realized because of uncertainties related to estimates of volume or area. Verification sampling conducted during the remedial design phase will be necessary to refine these estimates.

The Proposed Plan stated that for the Phase I remedy treatment residuals must meet RCRA TCLP standards in addition to meeting Treatability Variance standards. Further analysis of these standards indicated that Treatability Variance standards are nearly equivalent to TCLP standards, so the requirement that residuals meet TCLP standards was eliminated.

The Proposed Plan stated that, for the Phase II remedy, groundwater would be remediated if it exceeded a cumulative carcinogenic risk of 10^{-5}, and MCLs or non-zero MCLGs for non-carcinogens. Further analysis of cleanup standards indicated that MCLs, proposed MCLs, or non-zero MCLGs provided a more appropriate cleanup level than the 10^{-5} cumulative carcinogenic risk level, for the reasons discussed in Section IX. The cleanup standards for aquifer remediation were changed accordingly.

XI. STATUTORY DETERMINATIONS

Protection of Human Health and the Environment

The EA developed for the Acme Solvents site showed that ingestion and inhalation of contaminated groundwater and dermal exposure to and incidental ingestion of site soils in waste areas pose the greatest risks associated with the site. Provision of an alternate water supply to residents downgradient of the site, extraction and treatment of contaminated groundwater, and imposition of access restrictions to contaminated groundwater until aquifer remediation is attained will address risks from groundwater. Implementation of LTTS treatment of waste area soils and sludges, SVE treatment of remaining contaminated soils and bedrock gas, and capping of all contaminated areas will protect against risks from direct contact with soils. In addition, removal of VOCs from soils and bedrock through SVE and LTTS will reduce the source of VOCs to the aquifer and will thereby decrease the overall time required to remediate the aquifer. All risks resulting from exposure will be reduced to MCLs, a 1×10^{-5} carcinogenic risk level or an HI of less than one.

Use of emissions controls will protect against short term exposure to contaminants during the remedial action. No environmental impacts due to site contamination have been identified, and discharge of treated water to Killbuck Creek will be regulated by NPDES to ensure that the remedial action does not affect aquatic life.

Attainment of Applicable, or Relevant and Appropriate, Requirements

The selected Phase I and Phase II remedial actions will meet all identified applicable, or relevant and appropriate, federal and remedial action goals for all contaminants than some of the less established technologies considered, such as SVE followed by solidification, and chemical oxidation.

Of the alternatives that provided for aquifer treatment, USEPA and IEPA selected Phase II Alternative 5 over Alternative 4 because Alternative 4 would not treat VOCs in soil and bedrock. Treatment of the source of groundwater contamination has been found to reduce aquifer remediation time. Alternative 6 was not selected because it only adds treatment of very low levels of relatively immobile contaminants such as BEHP, PCBs, and lead (which can be effectively contained) at almost double the cost of Alternative 5.

Preference for Treatment as a Principal Element

The selected remedy provides for treatment of the principal threats at the site. The Phase I remedy treats the highest concentrations of VOCs, SVOCs, PCBs, and lead in the waste areas and tanks by LTTS and incineration, respectively, followed by solidification, if necessary. Phase II provides for additional treatment of VOCs, the most mobile of the remaining contaminants, by soil/bedrock vapor extraction and by extraction and treatment of groundwater. The only contaminants that will remain to be contained by the soil cover will be low levels of relatively immobile contaminants such as BEHP, PCBs, and lead. The selected alternatives thus satisfy the statutory preference for treatment as a principal element.

APPENDIX A

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX - UPDATE #3
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	9	83/04/15	Letter Re: results of samples taken on March 8, 1983 from two private wells with attachments	Roger J. Ruden ILLINOIS DEPARTMENT OF PUBLIC HEALTH	B.Favero, IEPA	CORRESPONDENCE	1
	7	89/09/01	Letter Re: Scope of work developed for conducting aquifer tests	Fred Marinelli HARDING LAWSON ASSOCIATES	A.Hiltner, USEPA	CORRESPONDENCE	2
	4	90/05/11	Letter Re: Residential Water-Supply Analytical Data with attachments	Brian D.LaFlamme Michael J. Malley HARDING LAWSON ASSOCIATES	A.Hiltner, USEPA	CORRESPONDENCE	3
	4	90/11/02	Letter Re: Proposed Plan October 1990	Andrew Fletsch THE TESTOR CORPORATION	S.Kaiser/A.Hiltner, USEPA	CORRESPONDENCE	4
	17	90/11/05	Letter Re: Administrative Record with attachment	Steven J. Lemon WINSTON & STRAWN	S.Kaiser, USEPA	CORRESPONDENCE	5
	3	90/11/05	Letter Re: Proposed Plan	Gary Letcher THE HARKER FIRM	A.Hiltner, USEPA	CORRESPONDENCE	6
	4	90/11/05	Letter Re: Comments on Supplemental Technical Investigation Report (STI) and Proposed Plan	John Holmstrom III WINNEBAGO RECLAMATION SERVICE, INC.	A.Hiltner, USEPA	CORRESPONDENCE	7
	54	90/10/18	Public Hearing on the Proposed Plan	USEPA		MEETING NOTES	8
	28	90/03/02	Memo	Michael J. Malley	A.Hiltner, USEPA	MEMORANDUM	9

ADMINISTRATIVE RECORD INDEX - UPDATE #3
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			Re: Residential Water-Supply Well Analytical Data with attachments	HARDING LAWSON ASSOCIATES			
	4	90/08/20	Memo Re: Residential Water-Supply Well Analytical Data with attachments	Brian D. LaFlamme HARDING LAWSON ASSOCIATES	A.Hiltner, USEPA	MEMORANDUM	10
	7	90/11/07	Memo Re: Residential Water-Supply Well Analytical Data with attachments	Brian D. LaFlamme HARDING LAWSON ASSOCIATES	A.Hiltner, USEPA	MEMORANDUM	11
	14	85/09/30	Responses to numbered conclusions from "part one," QA/QC Program Review	E.Jordan		OTHER	12
	2	90/12/15	Treatment System Net Present Worth (NPW) with Fax Transmittal attachment	Carla Buriks PLANNING RESEARCH CORPORATION (PRC)	A.Hiltner, USEPA	OTHER	13
	7	86/11/07	Progress Report on Clean-Up Activities	Environmental Resources Management/ North Central, Inc.	USEPA	REPORTS/STUDIES	14
	98	90/10/11	Northwest Area Investigation Final Report	Brian D. LaFlamme Michael J. Malley HARDING LAWSON ASSOCIATES	AS Steering Committee	REPORTS/STUDIES	15

ADMINISTRATIVE RECORD INDEX - UPDATE #3
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	80	12/90/00	Record of Decision (ROD)	Valdas Adamkus USEPA		REPORTS/STUDIES	16

ADMINISTRATIVE RECORD INDEX - UPDATE #2
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	3	90/02/09	Letter Addendum to December 15, 1989, Work Plan Northwest Area Investigation	Joshua D. Rosen Harding Lawson Associates	A.Hiltner - USEPA	Correspondence	1
	2	90/02/16	Letter Re: Northwest Area Investigation Acme Solvents Superfund Site	Allison Hiltner USEPA	F.Marinelli - HLA	Correspondence	2
	23	90/04/13	Letter Re: Identification of Applicable, or Relevant and Appropriate Requirements for the Acme Solvents Superfund Site with attachments	Allison L. Hiltner USEPA	F.Marinelli - HLA	Correspondence	3
	8	90/04/23	Letter Re: State Applicable, or Relevant and Appropriate Requirements for the Acme Solvents Superfund site with attached letter	Allison L. Hiltner USEPA	F.Marinelli - HLA	Correspondence	4
	3	90/06/26	Letter Re: Disposal of Remaining Soil and Debris from the Acme Solvents Reclaiming, Inc.	Anthony E. Rothschild Butler, Rubin, Newcomer, Saltarelli, Boyd & Krasnow	A.Hiltner - USEPA	Correspondence	5
	58	90/07/20	Letter Re: Proposal to dispose of the remaining contaminated soil and debris	Anthony E. Rothschild Butler, Rubin, Newcomer, Saltarelli, Boyd & Krasnow	S.Kaiser - USEPA	Correspondence	6

ADMINISTRATIVE RECORD INDEX - UPDATE #2
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			with attachments; including: Record of Decision (ROD)				
	3	90/08/29	Letter Re: Disposal of Remaining Soil and Debris Acme Solvent Reclaiming, Inc.	Steve P. Kaiser Allison L. Hiltner USEPA	A.Rothschild - BBNSBI	Correspondence	7
	23	89/12/21	Work Plan Northwest Area Investigation Acme Solvents Reclaiming, Inc.	Joshua D. Rosen Harding Lawson Associates	USEPA	Reports/Studies	8
	206	90/08/06	Engineering Evaluation/ Cost Analysis Final Report Acme Solvents Superfund Site Volume II of II	Harding Lawson Associates	USEPA	Reports/Studies	9
	279	90/08/06	Engineering Evaluation/ Cost Analysis Final Report Acme Solvents Superfund Site Volume I of II	Brian K. Boggs Dennis K. Smith Harding Lawson Associates	USEPA	Reports/Studies	10
	186	90/09/28	Remedial Action Alternatives Evaluation Final Report Acme Solvents Site Volume I of II	Brian D. LaFlamme John E. Hopkins Dennis K. Smith Harding Lawson Associates	USEPA	Reports/Studies	11
	185	90/09/28	Remedial Action Alternatives Evaluation	Harding Lawson Associates	USEPA	Reports/Studies	12

ADMINISTRATIVE RECORD INDEX - UPDATE #2
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			Final Report Acme Solvents Volume II of II				
	10	90/10/00	Proposed Plan for the Acme Solvent Reclaiming, Inc. Superfund Site	USEPA		Reports/Studies	13
	37	90/07/06	Preliminary and validated ground-water chemistry results for samples obtained during the Northwest Area Investigation (Sampling Data)	F.Marinelli Harding Lawson Associates	A.Miltner - USEPA	Sampling Data	14

ADMINISTRATIVE RECORD INDEX - UPDATE #1
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	23	90/06/08	Letter Re: General Notice of Potential Liability Acme Solvent Reclaiming, Inc. Superfund Site Winnebago County, Illinois with attachments (A,B,C, & D)	John R. Kelley USEPA	See Attachment B	Correspondence	1
	6	90/05/00	Acme Solvent Reclaiming, Inc. Site Superfund Fact Sheet Update	USEPA		Fact Sheets	2
	25	87/09/00	Final Community Relations Plan Acme Solvent Site and Pagel's Pit Site Rockford, Illinois	Jacobs Engineering Group, Inc.	USEPA	Reports/Studies	3
	433	90/02/23	Supplemental Technical Investigation Final Report Acme Solvents Site Winnebago County, Illinois Volume 2: Appendices	Harding Lawson Associates	Acme Steering Committee	Reports/Studies	4
	642	90/02/23	Supplemental Technical Investigation Final Report Acme Solvents Site Winnebago County, Illinois Volume 3: Appendices	Harding Lawson Associates	Acme Steering Committee	Reports/Studies	5

ADMINISTRATIVE RECORD INDEX - UPDATE #1
ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
WINNEBAGO COUNTY, ILLINOIS

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	188	90/03/14	Remedial Action Alternatives Array Draft Report Acme Solvents Site Winnebago County, Illinois	Harding Lawson Associates	Acme Steering Committee	Reports/Studies	6
	24	90/03/20	Health Assessment for Acme Solvents Reclamation, INC. Winnebago County, Illinois	U.S. Public Health Service	USEPA	Reports/Studies	7
	188	90/05/29	Supplemental Technical Investigation Final Report Acme Solvents Site Winnebago County, Illinois Volume I: Main Text	Harding Lawson Associates	Acme Steering Committee	Reports/Studies	8
	442	90/06/08	Final Endangerment Assessment Acme Solvents Site National Priorities List Number 652 Winnebago County, Illinois Volume One	Levine * Fricke	Acme Settlors Coalition	Reports/Studies	9
	463	90/06/08	Final Endangerment Assessment Acme Solvents Site National Priorities List Number 652 Winnebago County, Illinois Volume Two Appendices	Levine * Fricke	Acme Settlors Coalition	Reports/Studies	10

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ACME SOLVENT RECLAIMING, INC.
WINNEBAGO COUNTY,
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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT
2 A1	1	73/03/15	Notice that satisfactory progress is being made with the restoration of the site.	C.E.Clark-IEPA	Vito Pusilla-Acme Solvent	Correspondence	1
2 A2	1	73/04/09	Notice that the facility has been satisfactorily closed and covered.	C.E.Clark-IEPA	Vito Pusilla-Acme Solvent	Correspondence	2
2 A3	2	81/07/01	Letter of concern from a nearby resident over possible contamination of her well water and a request to the IEPA that they test her water. Attached is an newspaper article concerning Pagel's Pit.	Mrs. Daryl Thompson	IEPA	Correspondence	3
2 A6	1	81/07/16	Response to local resident's concerns over her well water.	Robert Casteel-IEPA	Mrs. Daryl Thompson	Correspondence	4
2 A7	1	81/08/18	Notice that water has been deemed unsafe for drinking. Letters mailed to the Lyfords, Baxters and the Linds.	Robert Mosgrove-IEPA	See title	Correspondence	5
2 A8	2	82/01/12	Notice that the site is in violation for not complying with an Ill. Pollution Control Board Order.	Kuykendall & Seebald-IEPA	Vito Pusilla-Acme Solvent	Correspondence	6
2 A10	1	83/02/15	Notice that water is unfit for human consumption.	Robert Mosgrove-IEPA	J.Herrick-Rockford Sheet	Correspondence	7
2 A11	4	84/06/15	Notice that the USEPA considers the recipients of this letter may be responsible parties and may be liable for the costs associated with removal and remedial	Basil Constantelos-USEPA	Acme PRP's	Correspondence	8

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOC#
			Acme Solvent/Pagel's Pit Volume One.				
2 F13	2	72/03/13	Report on meeting between Vito Penilla and Robert Rocha of the IEPA concerning sludge disposal practices and potential problems.	Paul Barry-IEPA	Div.of Water Poll.Control	Memorandum	23
2 G1	1	75/10/09	After a visit to the site, the author believes that the site has a potential to become a major problem and suggests that the matter be reopened.	Kenneth Bechely-IEPA	Dennis Johnson-IEPA	Memorandum	24
2 G2	5	83/06/21	Documentation of a meeting with the Millers, Palmers, and Thompsons(area families).	Dave Favero-IEPA	File	Memorandum	25
2 G8	1	84/12/11	Extension of public comment period until 12/28/84.	Gloria Craven-IEPA	All present-PublicHearing	Memorandum	26
2 G9	19	85/02/15	Recommended Remedial Action for the Acme Solvent Site.	Dave Favero-IEPA	Bob Cowles-IEPA	Memorandum	
3 B3	2	85/05/29	Position statement of the IEPA supporting the Record of Decision signed 4/1/85 by Richard Carlson of the IEPA (with-out attachment).	Robert Kuykendall-IEPA		Memorandum	28
3 B5	3	86/11/12	Memo transmitting an attached public comment letter on the Consent Order. The letter is from Betty Johnson of the League of Women Voters and is dated 11/9/86.	Margaret McCue-USEPA	Daggett,et al. - USEPA	Memorandum	29

ADMINISTRATIVE RECORD INDEX
ACME SOLVENT RECLAIMING, INC.
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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
3 B8	3	86/10/10	"U.S.EPA Seeks Public Comment On Acme Site Investigation."	USEPA		News Release	30
3 B11	1	87/06/24	EPA To Answer Questions On Acme Solvent And Pagel's Pit Superfund Sites.	USEPA		News Release	31
3 B12	1	84/12/06	Hearing Officer's Opening Statement at 12/6/84 public meeting.	Gloria Craven-IEPA		Other	32
3 B13	1	84/12/06	Agenda of 12/6/84 public meeting and notice of comment period.	IEPA		Other	33
3 B14	5	86/06/00	Completed Residential Survey forms.	Area residents		Other	34
3 C5	153	86/09/29	Administrative Order By Consent with attachments.	USEPA	Acme PRP's	Pleadings/Orders	35
4 G8	7	00/00/00	Community Relations Responsiveness Summary.	IEPA		Reports/Studies	36
5 A1	18	72/05/16	Field Investigation Report	Gerald Kehoe-IEPA	IEPA	Reports/Studies	37
5 B7	1	72/12/05	Inspection Report.	Rocha & Prichard-IEPA		Reports/Studies	38
5 B8	5	75/06/16	DLPC Geological Investigation Report.	Thomas P. Clark-DLPC, IL.		Reports/Studies	39
5 B13	1	76/07/21	Inspection Report.	"DAF" - IEPA		Reports/Studies	40
5 B14	14	82/10/25	Site Inspection Report	Tom Koch-Ecology & Environment	USEPA	Reports/Studies	41
5 C14	5	82/12/21	Preliminary Assessment	Paul Shea-Ecology & Environment	USEPA	Reports/Studies	42
5 D5	82	83/02/00	Remedial Action Master Plan (RAMP).	Roy F. Weston, INc.	USEPA	Reports/Studies	43

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ACME SOLVENT RECLAIMING, INC.
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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
6 C11	116	83/03/00	Extent Of Sources Of Groundwater Contamination- Acme Solvents Pagel's Pit Area Near Morristown, Illinois.	Ecology & Environment, Inc.	USEPA	Reports/Studies	44
7 F7	18	83/08/09	Community Relations Plan.	Daphne Gemmill-USEPA	Sam Borekas-USEPA	Reports/Studies	45
7 G3	74	84/00/00	"Geology For Planning In Boone And Winnebago Counties."	Berg, Kempton & Stecyk-Il.Dept.Energ		Reports/Studies	46
8 E8	184	84/01/27	Quality Assurance Project Plan for the RI/FS.	E.C. Jordan Co.	IEPA and USEPA	Reports/Studies	47
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40 G5	61	87/07/02	Revised Work Plan	Bryant & Rosasco-Harding Lawson	Dave Favero-USEPA	Reports/Studies	71
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DOCUMENTS ARE NOT COPIED, BUT MAY BE REVIEWED AT THE USEPA
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DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
00/00/00	Raw data and chain-of-custody forms available for review			SAMPLING DATA

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ACME SOLVENT RECLAIMING INC. SUPERFUND SITE
GUIDANCE DOCUMENTS ARE AVAILABLE FOR REVIEW AT
USEPA REGION V - CHICAGO, ILLINOIS

TITLE	AUTHOR	DATE
Determining When Land Disposal Restrictions (LDRs) Are Applicable to CERCLA Response Actions Superfund LDR Guide #5 (4 pgs.)	USEPA OSWER Dir. # 9347.3-05FS	89/07/00
Obtaining a Soil and Debris Treatability Variance for Remedial Actions Superfund LDR Guide #6A (6 pgs.)	USEPA OSWER Dir. # 9347.3-06FS	89/07/00
Overview of RCRA Land Disposal Restrictions (LDRs) Superfund LDR Guide #1 (4 pgs.)	USEPA Publication # 9347.3-01FS	89/07/00
Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (4 Pgs.)	USEPA OSWER Dir. # 9355.4-02	89/09/07
RCRA ARARs: Focus on Closure Requirements (6 pgs.)	USEPA OSWER Dir. # 9234.2-04FS	89/10/00
Guidance on Remedial Actions for Superfund Sites with PCB Contamination Superfund Management Review Recommendation 23 (158 pgs.)	USEPA OSWER Dir. # 9355.4-01	90/08/15

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AUTHOR	DATE
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OSWER Dir. #9260.2-01-A	84/04/1
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OSWER Dir. #9260.2-14-A	84/04/1:
OSWER Dir. #9260.2-14-B	84/04/1(

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ients affected by the proposed water main were invited to a l group meeting prior to the full public meeting to discuss r concerns. They were mainly concerned that the operators of l's Pit Landfill would have influence over the use of their , and might not provide a clean or reliable water supply.

SUMMARY OF SIGNIFICANT COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND USEPA RESPONSES

comments are organized into the following categories:

Summary of comments from the local community
1. Comments from residents
2. Comments from Winnebago Reclamation Landfill

Summary of comments from Potentially Responsible Parties

comments are paraphrased in order to effectively summarize in this document. The reader is referred to the public ing transcript and written comments available at the public sitory for further information.

SUMMARY OF COMMENTS FROM THE LOCAL COMMUNITY

COMMENTS FROM RESIDENTS

ENT: The residences on Edson Road directly south of the site ld be hooked up to the water main. Since the contamination s close to these areas, residents are concerned that the aminants will eventually reach these wells.

ONSE: The final decision regarding which residents will be ed up to the water main will be made during the design phase additional sampling will be performed to ensure that all dents with contaminated or potentially contaminated water at ls exceeding those set forth in the ROD are hooked up. dents who are not hooked up will be protected from migration ontaminants by the pump and treat system, which will draw aminated water away from residences.

ENT: How can USEPA and IEPA be sure that the Pagel's Pit r supply will not become contaminated? Pagel's Pit operators purchased a farm to the north of the Landfill. What will en if they expand the landfill to the north and contaminate water supply well?

ONSE: Water from the Pagel's Pit well has been tested in the and has been found to be uncontaminated. However, USEPA and intend to negotiate an agreement with Potentially onsible Parties (PRPs) which contains standards for the ity of the water provided to residents. The PRPs will be ired to sample the well water periodically to ensure these standards are being met. If the water from the Pagel's Pit well does not meet these standards, the PRPs must drill a new well away from contaminated areas which meets these standards. If the Agencies' enforcement actions are unsuccessful, they will fund the construction of the water main and make sure it meets these standards.

COMMENT: The operators of Rockford Blacktop Quarry (north of Acme Solvents) are blasting the fractured bedrock. This could be causing further groundwater contamination. The Federal or State EPA should check on this.

RESPONSE: Some of the wells drilled and sampled for the Acme Solvents investigation are near the Rockford Blacktop Quarry. Analyses of samples collected from these wells to date have not shown any groundwater contamination in this area. USEPA and IEPA will try to make further inquiry about the extent of blasting during the design phase to see if these activities may affect the groundwater, but the information we have collected to date indicates that this is unlikely.

COMMENT: USEPA and IEPA should purchase the houses in the area, rather than spending money remediating the Acme Solvents site.

RESPONSE: CERCLA requires that permanent solutions and treatment technologies be used to remediate Superfund sites to the maximum extent practicable. If the Agencies purchased homes rather than treating the contaminants at the site, contaminants would continue to leach to the Galena-Platteville aquifer and render a large portion of the aquifer unusable. USEPA's goal as stated in the NCP is to restore aquifers to their beneficial uses in a reasonable timeframe, as well as to prevent harm to future users of or trespassers on the site due to contact with hazardous substances. Purchase of the homes surrounding the site, as an alternative to remediating the site, would not meet these goals.

USEPA's policy is to purchase property as part of a Superfund remedial action only when the property is needed to perform the cleanup or when inhabitants cannot be adequately protected from site contaminants by other means. In this case, inhabitants are protected from contaminated groundwater through home carbon treatment units as an interim measure, and an alternate water supply as a final measure, making the purchase of these homes unnecessary.

COMMENT: USEPA and IEPA appear to be ineffective in addressing the problems associated with the Acme Solvents site. They have done little to clean up the site since it was discovered and were ineffective in stopping the 1986 unauthorized PRP cleanup.

RESPONSE: The 1986 unauthorized PRP cleanup was an unprecedented situation in the history of Superfund and as a result, a new

provision was written into the Superfund law to prevent such a situation from occurring in the future. The Agencies' dispute with the PRPs was over the disposal of the contaminated materials. However, the PRPs' action did result in a net benefit to residents in that approximately 40,000 tons, or 90 percent of the highly contaminated soils and sludges were removed from the site. These materials were not transported to Pagel's Pit Landfill, as some residents suspect. They were transported to permitted hazardous waste landfills in Indiana and Alabama.
In addition, the Agencies have, since 1981, ensured that residents received bottled water, then home carbon treatment units, to protect them from contaminated groundwater. The Agencies have also provided regular monitoring to ensure that no additional residential wells have become contaminated. Thus, a large portion of the needed remediation of the Acme Solvents site has already been accomplished and the Agencies have assured that residents have been protected from site contaminants in groundwater since 1981.

COMMENT: Someone should monitor health problems in the area.

RESPONSE: The Agency for Toxic Substances and Disease Registry (ATSDR) has established a national exposure registry for persons exposed to trichloroethene (a contaminant of concern at Acme Solvents) in drinking water. Currently, residents in Michigan, Indiana and Illinois are enrolled. There are no plans to expand the registry at this time, however, if the registry is expanded in the future, residents around the Acme site could be considered.

COMMENT: Residents near the site observed that during the 1986 cleanup the trucks were not lined to prevent leakage of contaminants out of or onto the trucks.

RESPONSE: The persons responsible for the 1986 cleanup have stated that the trucks used were properly decontaminated. Any future cleanups at the site will be done with USEPA and IEPA oversight to ensure that trucks are lined and/or decontaminated.

2. COMMENTS FROM WINNEBAGO RECLAMATION SERVICE, INC.

COMMENT: The STI Report for the Acme Solvents site concludes that there are two separate sources of volatile organic chemicals (VOCs) in the area's groundwater: (1) unremediated soil/sludge located at the Acme Solvents site; and (2) an unidentified source located along the eastern boundary of the Winnebago Reclamation Landfill (WRL), or Pagel's Pit, Superfund site, which is located immediately to the west and downgradient of the Acme Solvents site. That finding is not based on empirical evidence but on interpretation of chemical distributions in groundwater.

Winnebago Reclamation Services (WRS) submits that the most plausible explanation for the presence of VOC contamination at that location is that it migrated with the groundwater from the Acme Solvents site. Acme Solvents disposed of hazardous materials, including VOCs, in unlined lagoons having direct access to groundwater. The bedrock underlying the site is highly fractured and the hazardous substances were disposed of in an area of groundwater recharge. Seasonal variations in recharge and the change in source concentrations due to various remedial activities, and the complex behavior and flow of dense solvents in a fractured medium make it virtually impossible to pinpoint the source of VOCs without any speculation. However, WRS feels that the Acme Solvents site is a more plausible source than WRL. The detection of VOCs in two of three additional wells drilled on the Acme site and between the two sites further supports WRS's claim that the source of contamination at the eastern boundary of the Pagel's Pit site is Acme Solvents. In fact, the evidence suggests that Acme Solvents is the sole source of VOCs in groundwater in that area.

RESPONSE: USEPA has stated in several conversations and correspondence with both Acme Solvents and Pagel's Pit PRPs that additional studies are needed to determine the source of contamination at the eastern boundary of the Pagel's Pit site. Review of the Acme Solvents STI Report and the Pagel's Pit draft RI report shows that arguments can be made for a source at the Acme site or at the eastern boundary of the landfill. Acme Solvents PRPs have been cooperative in drilling and sampling additional wells in an effort to determine the source of contamination. The Acme Solvents PRP's Northwest Area Investigation report, available as part of the Administrative Record for the site, argues that the presence of VOCs in the additional wells does not indicate that Acme Solvents is the source of the contamination at the landfill.

USEPA and IEPA are currently evaluating the additional information provided by the Acme Solvents PRPs in an effort to determine the source of this contamination. However, Pagel's Pit PRPs have been quite uncooperative in refusing to perform additional studies as requested by USEPA. It has been and will continue to be quite difficult to evaluate WRS's claim that Pagel's Pit is not the source of this contamination without the cooperation of Pagel's Pit PRPs in performing additional studies.

COMMENT: WRS expects the Acme Solvents site PRPs to fund any remedial measures that may be required in the areas of the WRL site attributable to substances originating at the Acme Solvents site, including but not limited to the VOC plume which extends under the WRL site. Any Covenant Not to Sue in connection with any Consent Decree for work performed at the Acme Solvents site must therefore be strictly limited to work actually done, and limited to the area where the work is done, and must not purport to release any claims for remedial action in areas outside those actually fully remediated by the Acme Solvents PRPs.

RESPONSE: Since this ROD specifically excludes the contamination at the eastern boundary of Pagel's Pit Landfill, USEPA and IEPA anticipate that this area of contamination will also be excluded from Consent Decree negotiations. USEPA and IEPA do not intend to relaease Acme Solvents PRPs (or Pagel's Pit PRPs) from any potential liability associated with this area of groundwater contamination at this time.

COMMENT: WRS urges that the remedy chosen in the Record of Decision (ROD) regarding the Acme Solvents site be no less stringent than that proposed in EPA's Proposed Plan for the site. The WRL site is downgradient of Acme Solvents. If the WRL site were not a waste disposal facility, the remedies selected at Acme Solvents would undoubtedly attempt to eliminate any downgradient contamination attributable to Acme Solvents as promptly and as thoroughly as possible. Instead, however, the Proposed Plan indicates that because the WRL site is a landfill, additional study and delay in implementing remedying the impact of Acme Solvent on WRS are acceptable. The Acme Solvents remedy should be implemented to address the entire area impacted by the Acme Solvents site, including the area southeast of the WRL facility.

RESPONSE: The delay in implementation of a remedial action at the southeast corner of Pagel's Pit is not because the area in question is a landfill. This delay is solely due to the fact that additional time is needed to better identify the sources of this contamination. In fact, Pagel's Pit PRPs have played a large part in causing this delay by refusing to perform additional studies necessary to determine the source.

COMMENT: WRL urges that the design and implementation of remedies at Acme Solvents be coordinated with ongoing investigation or remediation at the WRL and with the ongoing operation of the WRL. The well locations, recharge points, access controls, water supplies, ongoing monitoring, pilot tests, and virtually every other element of the Acme Solvents remedy will be more effective if open cooperation and communication with WRS (and the Pagels Landfill Steering Committee) are encouraged by your agency.

RESPONSE: USEPA and IEPA agree with this comment and continue to encourage cooperation and communication between Acme Solvents PRPs, Pagel's Pit PRPs, and the Agencies regarding matters that affect both sites.

B. COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

COMMENT: Many former customers of Acme have not received a copy of the Proposed Plan for remedial action and have not been participating in discussions with the Agencies regarding the plan. USEPA appears to be targeting for enforcement actions only a small portion of the firms responsible for site contamination. These companies are being asked to shoulder a disproportionately large share of the response costs.

RESPONSE: USEPA intends to send Special Notice Letters informing PRPs of the start of negotiations for implementation of the remedial action to all known PRPs. USEPA sent a General Notice of Potential Liability to approximately 65 PRPs on June 8, 1990 and sent the Proposed Plan on October 5, 1990 to the same group. The current PRP service list for Acme Solvents is attached to the June 8, 1990 letter. Several PRPs did not receive this letter or the Proposed Plan because USEPA has no, incorrect, or incomplete addresses. USEPA is currently attempting to update this information and welcomes information from the public or PRP community which would allow us to supplement our PRP list.

COMMENT: The Acme Solvents Settlors Coalition generally endorses USEPA's identification of preferred alternatives for cleaning up the Acme site. In particular, the Coalition believes that the bifurcated approach identified by USEPA for cleaning up source areas in Phase I and contaminated soils, bedrock and groundwater in Phase II is appropriate. The Coalition agrees, in general, that the preferred response alternatives identified by USEPA would protect human health and the environment, would comply with ARARs, would be cost effective, and would use permanent solutions and alternative treatment technologies to the maximum extent practical.

RESPONSE: No response necessary.

COMMENT: USEPA has employed a residential future use scenario in arriving at a groundwater cleanup level of 10^{-5} lifetime excess cancer risk (LECR). The Settlors Coalition remains convinced that employment of a non-residential future use scenario would be more appropriate. Given such a scenario, coupled with institutional controls, alternative water supply, and a RCRA cap, groundwater clean-up levels of 10^{-4} (or something between 10^{-4} and 10^{-5}) LECR would be justified, sufficiently protective, and more cost effective. Maximum contaminant levels (MCLs) should be used as the clean-up level for substances having MCLs.

RESPONSE: USEPA and IEPA disagree that a residential future-use scenario is inappropriate for the Acme Solvents site. The residential future-use scenario is consistent with current land use near the site and existing zoning restrictions, which allow for one single-family home per 40 acres. In addition, the NCP states that "groundwater that is not currently a drinking water source, but is potentially a drinking water source in the future would be protected to levels appropriate to use as a drinking water source." There are residential wells drawing from the Galena-Plattville aquifer in and near the contamination plume, making the aquifer unquestionably a current and potential source of drinking water.

Aside from the residential use issue, USEPA and IEPA have considered the comment that MCLs set under the SDWA should be used to set cleanup levels in groundwater. Because the concentrations of many of the contaminants of concern at the 10^{-5} LECR are well below analytical detection levels, and because of the technical difficulties associated with aquifer remediation in fractured bedrock, the Agencies have determined that this comment has technical merit. Accordingly, aquifer remediation goals have been set at 10^{-5} LECR (or a hazard index of 1) for 1,1-DCE and contaminants without MCLs, and MCLs, proposed MCLs, or non-zero MCLGs for contaminants with MCLs and MCLGs.

COMMENT: The preferred alternative for source areas (Phase I) calls for residuals left over from low-temperature thermal stripping (LTTS) to be solidified if TCLP standards for metals are exceeded, then covered by a RCRA cap (if landfilled on-site). Solidification and capping would be unnecessarily redundant, not optimally cost-effective, and not required under the NCP. Solidification or capping of residuals would be sufficiently protective, cost-effective and otherwise consistent with the NCP.

RESPONSE: The wording of the ROD has been changed slightly from that of the Proposed Plan. The Proposed Plan required that metals in residuals landfilled on-site meet both RCRA TCLP standards and RCRA Treatability Variance standards for soil and debris. Since these two sets of standards are very similar for metals, and the Treatability Variance standards are frequently lower than TCLP standard, USEPA has determined that requiring that only Treatability Variance standards be met will be sufficiently protective.

Attainment of Treatability Variance standards is required under RCRA Land Disposal Restrictions (LDRs, 40 CFR Part 268). These regulations set treatment standards that must be achieved before any land disposal of hazardous substances. Since either on-site or off-site disposal of LTTS residuals constitutes "land disposal", Treatability Variance standards must be met in order to comply with RCRA ARARs. These standards are required under the NCP and CERCLA, as they both require that all ARARs be met, unless a waiver is obtained.

Also, since the ROD does not require that a liner be constructed under materials landfilled on-site, and no cap is 100% effective, these standards and the additional standards provided in the ROD will provide further assurance that contaminants will not leach to groundwater.

COMMENT: Implementation of many of the particulars of the preferred alternatives will depend upon the results of treatability studies, pilot testing, and selection of appropriate standards and parameters that will become known only in the course of remedial design. Accordingly, the Record of Decision should not attempt to answer questions that are more appropriately addressed in the remedial design phase of the clean-up. In particular:

a. The disposition of residuals from treated source materials depends on the result of TCLP testing. Whether source material residuals are to be solidified, landfilled on site or landfilled off-site should not be specified in the ROD.

b. The cleanup levels applicable to the delineation of source materials, and selection of a method(s) for measuring such cleanup levels should be left to remedial design.

c. Delineation of areas to be covered by a RCRA cap depends upon the disposition of source material residuals and efficacy of soil and bedrock vapor extraction, among other factors, and should be left to the remedial design.

d. Where and how the efficacy of soil and bedrock vapor extraction is measured depends on pilot testing, delineation of areas to be capped, and potential for groundwater contamination, among other factors, and should be left to remedial design. The Settlors Coalition recognizes that USEPA believes the efficacy of soil vapor extraction should be measured in the soil matrix (as opposed to the off-gas stream). However, the point of measurement should not be specified in the ROD, but would be better determined in the remedial design and as the remedial action progresses.

e. The need for and methods of off-gas treatment, and disposal of residuals from off-gas treatment, from low temperature thermal stripping of source materials and soil/bedrock vapor extraction should be left to the remedial design.

f. The source of a permanent water supply for nearby residences should be left to the remedial design.

RESPONSE: Responses are provided in the same order as the comments above:

a. The ROD allows for on- or off-site disposal of treatment residuals.

b. USEPA and IEPA disagree with this comment. Cleanup levels for source materials have been specified in the ROD in order to ensure an adequate cleanup of the source areas.

c. USEPA and IEPA agree that further study is needed to delineate areas to be covered by a RCRA cap. These areas are not specified in the ROD.

d. A cleanup standard set in the soil matrix is necessary to ensure that the soil vapor extraction is adequately designed and implemented to protect human health and the environment by preventing further migration of VOCs to groundwater. USEPA and IEPA do not favor measurement of VOCs in the off-gas stream because it provides little information about the concentrations remaining in the soils and available to leach to groundwater. USEPA and IEPA recognize, however, the difficulty in setting and achieving cleanup standards in soil for vapor extraction and have set two cleanup standards, a less stringent standard, which will require a RCRA cap, and more stringent standard, which will not require a RCRA cap.

e. The ROD does not specify whether or what type of off-gas treatment will be required for any of the treatment technologies. It does state minimum air emissions standards which may not be exceeded during the remedial action, in order to ensure that the remedial action does not result in an increased health risk to downwind residents and workers. In addition all Federal, State, and local ARARs regulating air emissions must be met. Off-gas treatment will be required if any of these standards may be exceeded during the remedial action.

f. The ROD provides two options for an alternate water supply well: the Pagel's Pit water supply well or a new well drilled into the St. Peter Sandstone upgradient of site contamination.

COMMENT: The Acme Solvents PRP Steering Committee has requested that 129 documents be included in the Administrative Record for the Acme Solvents site (a complete index of these documents is included in the Administrative Record).

RESPONSE: USEPA, consistent with the guidance set forth in the NCP, has reviewed the documents submitted by the PRPs. The NCP counsels, "The lead agency shall establish an administrative record that contains the documents that form the basis for the selection of a response action...." It goes on to state, "The lead agency is not required to include documents in the administrative record file which do not form a basis for the selection of the response action. Such documents include, but are not limited to, draft documents, internal memoranda, and day-to-day notes of staff unless such documents contain information that forms the basis of selection of the response action and the information is not included in any other document in the administrative record file."

Many of the docments submitted for inclusion were draft documents which were not relied upon for the selection of a remedy. Other documents contained information which could be found in documents already contained in the Administrative Record. Many of the documents included in the index are already in the Administrative Record (see Appendix A.) Still other documents chronicled events which were irrelevant to the process by which the remedy was selected.

Some documents, however, were relevant to the remedy selection process and, to date, had not been included in the Administrative Record. These documents were added to the Administrative Record. Specifically, the following documents were added:

September 1, 1989 letter to Allison Hiltner from Fred Marinelli re: additional aquifer tests.

August 11, 1990 Northwest Area Investigation Final Report by Harding Lawson Associates.

August 20, 1990 letter to Allison Hiltner from Brian LaFlamme re: residential water supply analytical data.